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# APPENDICES TO THE ENVIRONMENTAL ASSESSMENT for PRESIDENTIAL PERMIT APPLICATIONS for BAJA CALIFORNIA POWER, INC. and SEMPRA ENERGY RESOURCES

**U.S. DEPARTMENT OF ENERGY**
**WASHINGTON, D.C.**

**U.S. DEPARTMENT OF INTERIOR**
**BUREAU OF LAND MANAGEMENT**
**EL CENTRO, CALIFORNIA**
**Cooperating Agency**
**Reference Nos. CA-42892 and CA-42893**

# APPENDICES

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# APPENDIX A

# Project Description

# Project Description

## Proposed Project Features

The information in this description is based on preliminary plans. Such information as the number and location of support structures is subject to change as plans are refined. Most of the information on project features in this EA is based on information supplied by Baja California Power, Inc. (BCP) and Sempra Energy Resources (SER). All information such as the area of impact should therefore be regarded as intended to indicate the general extent and scope of the project and related features rather than a precise evaluation of the final design.

This project proposes to construct two double-circuit, 230 kilovolt (kV) transmission lines from the existing SDG&E Imperial Valley Substation (IV Substation), continuing southerly approximately six miles to the U.S./Mexican border, where each line would connect with a corresponding transmission line in Mexico. The transmission lines would be carried on steel lattice towers from the border to just south of the IV Substation, where steel monopoles would be used for each transmission line to allow the crossing of the Southwest Power Link. The Southwest Power Link is a 500 kV transmission line that enters the IV Substation from the east at the substation's southeast corner. Suspended on the steel monopoles, the proposed transmission lines would be carried along the east side of the substation to enter it from the north, similar to the way the existing San Diego Gas and Electric Company (SDG&E) transmission line is connected to the IV Substation.

From the international border to the last tower south of the 500 kV line at the substation, both the BCP and SER rights-of-way would parallel the existing SDG&E transmission line. The right-of-way for the BCP transmission line would be adjacent to the existing right-of-way for the SDG&E transmission line and would be 120 feet wide, so that the centerline would be 120 feet east of the centerline of the SDG&E right-of-way. The centerline of the SER right-of-way would be 120 feet east of the proposed BCP right-of-way. For both the BCP and SER transmission lines, steel lattice towers would be erected on the centerlines of the rights-of-way. The towers would be approximately 900 to 1,100 feet apart and would be roughly in line with the existing SDG&E towers in an east-west direction.

In this description, the towers for both lines will be referred to by numbers consecutively from south to north, with Tower No. 1 at the international border and Tower No. 25 just south of the substation. Similarly, the steel monopoles will be referred to by numbers consecutively from south to the north of the substation. The SER and BCP lines would each have nine support structures north of the lattice towers. These would all be steel monopoles except for A-frame crossing structures for the SER line to cross under the Southwest Power Link. The crossing structures are included in the pole numbering system as No. 2 and No. 3. Tower No. 1 in the BCP line would be about 250 feet north

of the international border; Tower No. 1 in the SER line would be about 330 feet north of the international border. Tower No. 25 in both the BCP and SER lines would be about 750 feet south of the 500 kV Southwest Power Link transmission line.

At the substation, in order to clear the 500 kV Southwest Power Link transmission lines and the last Southwest Power Link tower before the entry of the 500 kV line into the substation from the east, the BCP right-of-way would diverge westerly to cross the Southwest Power Link on the west side of the 500 kV tower. The SER line would continue northerly to cross the Southwest Power Link on the east side of the 500 kV tower. The SDG&E line, which passes under the 500 kV transmission line west of the 500 kV tower, would have to be relocated about 60 feet farther westward to allow room for the BCP transmission line to pass beneath the 500 kV transmission line west of the 500 kV tower. The SDG&E right-of-way would be moved only 30 feet to the west, and would be reduced from 120 feet to 60 feet in width where the SDG&E line crosses under the Southwest Power Link.

North of the Southwest Power Link, the SDG&E line and the BCP line would both be in adjacent 60-foot-wide rights-of-way. The SER circuits, after transitioning from vertical arrays to horizontal ones to cross under the Southwest Power Link on A-frame structures, then back to vertical arrays on steel monopoles, would continue north in a 120-foot right-of-way. As the three 230 kV lines turn west north of the substation, the BCP and SDG&E line would remain in 60-foot-wide rights-of-way. The SER right-of-way, adjacent to the BCP right-of-way on the north, would be 70 feet wide from the turn west to the substation. The Imperial Irrigation District (IID) 230 kV transmission line 50-foot-wide right-of-way, immediately north of the substation, would be relocated westward to the west of and adjacent to SER's right-of-way.

From the lattice towers, the conductors for the SDG&E, BCP, and SER lines would transition to steel monopoles south of the Southwest Power Link. The SDG&E and BCP lines would angle slightly westward to pass beneath the 500 kV line on the west side of the 500 kV tower nearest the substation. The SER line would continue northward to cross under the 500 kV transmission line on special A-frame structures, with steel monopoles north of the crossing. All three lines, SDG&E's, BCP's, and SER's, would continue northward after the crossing on steel monopoles along the eastern side of the substation, turn west along the north side of the substation, and then turn south, paralleling IID's line, to enter the substation from the north. The SDG&E and SER lines would have one monopole south of the Southwest Power Link; the BCP line would have two. The SER line will have pairs of A-frame crossing structure north and south of the Southwest Power Link. North of the Southwest Power Link, the SDG&E line would have five monopoles, the BCP line would have seven, and the SER line would have six. The steel monopoles will be spaced about 290 to 540 feet apart, depending on their location. The IID line would continue to utilize the one existing wooden monopole that would be relocated and one new wooden monopole.

Access roads would be needed to each lattice tower and monopole for operations and maintenance activities. For north-south access to the lattice towers, SER and BCP propose to use the existing SDG&E access road. From that "mainline" access road, east-west spurs would be needed to access each steel tower. Because the new lattice towers will roughly line up with the existing SDG&E towers, extensions eastward from the SDG&E mainline road would be used instead of new north-south access roads to minimize permanent surface disturbance. The same east-west spur would be used for the BCP and SER towers at each tower location, also to minimize surface disturbance. There are a number of unpaved roads in the project area, especially near the substation, and wherever possible, these roads would be used instead of grading new ones.

## Construction

Site preparation would begin with the grading of the SDG&E access roads, where necessary, and grading of new access roads to each tower location to allow the passage of construction equipment. Grading would create an unpaved roadbed about 10 to 12 feet wide. Access to the SDG&E access roads would be from State Route 98 or from existing roads to the IV Substation.

Towers and monopoles would be fabricated in segments in Mexico and carried to the construction site by helicopter. This would minimize the amount of laydown and work area required in the United States. Principal preparation at each tower and pole location would consist of preparing concrete foundation footings. Each tower would require four footings, one on each corner; a single footing would be needed for each monopole.

For each tower footing, a pit 3 to 4 feet in diameter would be excavated, approximately 15 feet deep. A reinforced concrete caisson would be cast in place in the excavated pit extending to above the ground surface. The concrete caissons would be allowed to cure for a minimum of seven days before the tower segments are mounted. It is anticipated that site preparation for the towers would proceed at a pace of about one and one-half sites per day.

The tower segments, an upper and lower segment for each tower, would be constructed of steel angle iron in Mexico and flown to the proper location in the United States by helicopter. The base segment would be lowered to the anchors and bolted in place by workers on the ground. Then the upper segment would be flown to the site and bolted to the lower segment. It is anticipated that the helicopter would spend about 15 minutes or less at each site to deliver the tower segments.

Two different sizes of lattice towers would be used, depending on function. Suspension towers, used where the cables will be strung in a straight line from one tower to the adjacent ones, would have a square base 30 feet by 30 feet. The last towers at the ends of the line ("dead end" towers) and three other towers in each line ("deflection" or "turning"

towers) would have a larger base, 40 feet by 40 feet. Dead end towers would be the first tower at the international border (Tower No. 1) and the last tower on the north (Tower No. 25). Deflection towers would be Tower No. 7, between the border and SR-98; Tower No. 13, just south of SR-98; and Tower No. 20, between SR-98 and the substation. Dead end and deflection towers would be about 157 feet high (above the ground surface). Suspension towers would be about 160 feet high.

Each tower would have three crossarms to carry the conductors, with cables suspended from insulators at the end of each crossarm. An additional crossarm at the top of the tower would carry, on each side of the tower, a static wire. The static wires would include the initial installation of communications fiber for system monitoring and additional black fiber for future communications use.

From the northernmost lattice tower in each transmission line, the conductors would pass on to steel monopoles to cross under the 500 kV Southwest Power Link to steel monopoles on the north side. The SER 230 kV transmission line, which would pass under the Southwest Power Link east of the 500 kV tower nearest the substation, would require special structures north and south of the 500 kV line to stabilize the SER conductors. Present plans show all three 230 kV transmission lines—SDG&E's, BCP's, and SER's—on steel monopoles north of the Southwest Power Link. However, it is possible that further refinement of design plans could use lattice towers in place of monopoles for part of the SER line.

In this description, monopoles are referred to by number, numbered consecutively from the southernmost pole (Pole No. 1) to the last pole before the conductors enter the substation. For the SER line, the pairs of A-frame crossing structures south and north of the Southwest Power Link are included in the pole numbering system as No. 2 and No. 3, respectively. Two types of monopoles would be used. Dead end and corner poles would be of heavier construction and would be about 95 feet high (above the ground surface). Suspension poles would be about 100 feet high. Dead end and corner poles in the SDG&E line would Poles No. 1, 5, and 6. Dead end and corner poles in the both the BCP and SER lines would be Poles No. 1, 7, and 9. Please note that the features of the BCP and SER lines north of the Southwest Power Link and the relocated SDG&E and IID lines, as described herein, are based on preliminary plans and may not represent the final design.

The monopoles would be brought to the site by truck in sections, assembled in laydown areas, and lifted into place using a 90-ton crane. If towers are used in place of poles for the SER line, the towers would be brought in by helicopter and assembled as described earlier.

To safely secure the SER conductors at the crossing of the Southwest Power Link, A-frame structures would be used. A pair of A-frames on the north and south sides of the

Southwest Power Link would be required for each circuit, for a total of four. Each A-frame would consist of two angled legs on each end, joined at the top to support a crossbar. Insulators to support the conductors would be suspended from the crossbar. Each leg of the A-frames would be bolted to a cylindrical concrete footing about 32 inches in diameter. A total of 16 footings would be needed for the A-frames.

The steel monopoles would be anchored in concrete footings poured in place. The footings would be approximately 8 feet in diameter and 15 to 25 feet deep for suspension poles and larger, about 10 feet in diameter, for dead end and corner poles. Holes for the pole and A-frame footings would be excavated using an augur. Guy wires will be needed for the corner poles.

Once the towers, poles, and crossing structures are in place, conductors would be strung on the SER and BCP lines for the entire length of the transmission lines, from the northernmost tower to the substation on the SDG&E line, and through the three southernmost poles on the IID line. The IID 230 kV conductor would be spliced, with new conductor being compression-connected to the existing conductor.

Truck-mounted cable-pulling equipment would be used to string the conductors on the support structures. Cables would be pulled through one segment of a transmission line, with each segment containing several towers or poles. To pull cables, truck-mounted cable-pulling equipment would be placed alongside the tower or monopole directly beneath the crossarm insulators (the "pull site") at the first and last towers or poles in the segment of the transmission line. The conductors would be pulled through the segment of line and attached to the insulators. Then the equipment would be moved to the next segment, with the "front-end" pull site just used becoming the "back-end" pull site for the next segment.

For the lattice towers, there would be 12 pull sites for each transmission line route, for a total of 24. The pull sites would be paired on each side of six towers in the BCP and SER transmission lines: Towers No. 1, the first tower north of the international border; No. 7, between the border and SR-98; No. 13 and No. 14, the two towers north and south of SR-98; No. 20, the tower at the angle between SR-98 and the substation; and No. 25, the northernmost tower.

For the monopoles near the substation, there would be pull sites at the first poles north of the lattice towers, Pole No. 1 in each line, and at the corners where the routes turn from north to west and from west south into the substation (Poles No. 5 and No. 6 for the SDG&E line, Poles No. 7 and No. 9 for the BCP and SER lines). Because the SDG&E transmission line in this section would be relocated westward, there would be pull sites for all three transmission lines. For the IID line, there would be one pull site at the IV Substation. Also, since each route would make right-angle turns in two locations, two pull sites for each circuit at each of these right angles, one aligned with each direction of

the turn, would be needed. The pull sites will be paired on each side of each pole, so a total of 30 pull sites would be needed for the monopoles around the substation.

Besides the conductors, both the SER and BCP lines would have two static wires atop the towers and poles above the conductors, one on each side. These static wires would include the initial installation of communications fiber (fiber-optic cable) for system monitoring, with additional black fiber for future communications use. At the 500 kV line crossing, these optical cables would be carried down the two poles on the SER and BCP lines on each side of the 500 kV line, buried in a trench from pole to pole under the 500 kV line, and carried back up the pole on the opposite side of the 500 kV line. It should be noted that SER is considering subleasing a portion or a majority of the fiber-optic cable to a subsidiary of Sempra Energy. If SER elects to do so, the fiber-optic cable for the SER line may be upsized so as to accommodate additional fibers. There would be no meaningful changes to construction techniques or to any equipment as a result of this possibility.

Construction would be completed by restoring disturbed ground surfaces to their original contours. Spoil dirt excavated for the footings would be spread on the ground, on access roads, or taken off-site for disposal in a permitted disposal site.

## Areas of Construction Impact

Areas of permanent impact would be those areas where the surface of the ground would be permanently disturbed. Specifically, new access roads and footings or anchors for tower, monopole, or crossing structures are areas that would be permanently impacted. Areas of temporary impact are areas where construction activity may take place but where restoration of the surface is possible. These areas include the work areas used to erect the towers, monopoles, or crossing structures; pull sites; laydown areas for the monopoles; and the trenches for the optical cables under the 500 kV transmission line at the substation. In some places, areas of temporary disturbance would overlap.

The following calculations of areas of impact or disturbance are based on an evaluation of preliminary plans. As plans are refined, the areas of impact may change. This assessment is intended to indicate the scale of possible impacts and serve as a basis for the general calculation of mitigation requirements. It should be noted that many areas of temporary disturbance, such as work areas around towers or poles and pull sites, would certainly overlap at least partially, so the total estimate for temporary impact area is overestimated and therefore conservative (worst-case).

The steel lattice transmission towers would have cylindrical footings three to four feet in diameter at each corner. Therefore, at each tower site, the permanent impacts would be a total of 50.24 square feet (assuming a 4-foot diameter) for suspension towers, deflection towers, or dead end towers. For 25 towers, the total area of permanent impact would be

1,256 square feet for each transmission line, or 2,512 square feet for both the BCP and SER tower footings.

The towers at each tower location would line up very nearly in a straight line from west to east (roughly perpendicular to the right-of-way centerlines). To minimize ground disturbance, it is proposed that access roads to each of the BCP and SER towers be constructed by extending "spurs" from the existing, mainline north-south SDG&E access road eastward. A single east-west spur would serve both the BCP and SER towers at any given location. This means that, allowing for some variation in a straight-line connection, approximately 250 linear feet of new access road would be needed at each of 25 tower locations. Assuming that graded access roads would be 12 feet wide, approximately 3,000 square feet of access roads would be needed at each tower location. For 25 tower locations, the total would be 75,000 square feet, or about 1.72 acres.

Areas of temporary impact at each tower would include a work area around the tower that would include the area of excavation for the anchors. No laydown areas would be needed for the towers, since the tower sections would be delivered into the work area by helicopter after assembly in Mexico. Suspension towers would be 30 feet by 30 feet square at the base. Assuming that excavation for the anchors would be 12 feet by 12 feet and that the work area would be five feet from the outer edges of the excavation, a square work area 52 feet by 52 feet, or 2,704 square feet, would be needed around each suspension tower. Subtracting the 16 square feet of permanent impact area from this total yields 2,688 square feet, or 0.06 acres, of temporary impact for the work area at each suspension tower. For 40 total suspension towers, 20 in the BCP line and 20 in the SER line, the total area of temporary impact would be 107,520 square feet, or about 2.46 acres.

Five deflection or dead end towers would be needed in each of the new transmission lines. These towers, which would also be the locations for pull sites, would be 40 feet by 40 feet square at the base. With the same allowance for anchor excavations and allowing for five feet of work area around the excavations' outer edges, the work area at each deflection or dead end tower would be 62 feet by 62 feet, or 3,844 square feet. Subtracting 16 feet of permanent impact area, the temporary impact for work area at each deflection or dead end tower would be 3,828 square feet. For the ten towers of this type in both the BCP and SER lines, the total work area impact would be 38,280 square feet or about 0.88 acre.

In addition to the work area, 12 pull sites for each transmission line for the lattice towers would add to the area of temporary disturbance. The lattice tower pull sites would be 30 feet by 50 feet or 1,500 square feet, centered on the crossarms beneath the towers. In the tower portion of each transmission line, the total area needed for pull sites would be 18,000 square feet, or 0.4 acre. For the BCP line and SER line tower segments together, 36,000 square feet or a total of approximately 0.83 acre of lattice tower related pull sites

would be needed. This is a very conservative estimate, since there would be considerable overlap of work areas and pull sites.

North of the steel lattice towers, conductors would transition to steel monopoles with crossing structures in the SER line where it crosses under the 500 kV Southwest Power Link. Footings for the monopoles would be concrete cylinders poured in augured holes. For the mainline poles, the footings would be eight feet in diameter; for corner and dead end poles, ten feet in diameter. The mainline poles north and south of the 500 kV line would have pull sites, 30 feet by 50 feet, centered on both sides under the crossarms. Other pull sites would be located at the corner poles, oriented in both directions, four at each corner pole. Laydown areas would also be needed, located near each pole site. As previously indicated, the poles would be assembled in sections on-site.

The relocated SDG&E line and the BCP line would be close together and close to the eastern and northern sides of the substation in the pole portion of their routes. The portion of the SER line directly north of the substation would be close to the BCP and the relocated IID lines. Poles would be closer than towers to each other. It should be noted that this area of the project site has been disturbed by past activity. The relocation of the SDG&E line and the construction of the BCP and SER lines would probably be carried out by different contractors using somewhat different construction methods. In addition, the existing SDG&E line structures (mostly wooden H-poles) would be removed as part of the relocation. Therefore, this area, which is the object of the relocation of the SDG&E line and the construction of the BCP line (that is, the area immediately east and immediately north of the IV Substation), would be subject to fairly intense construction activity.

It is reasonable to regard the entire corridor containing the BCP and relocated SDG&E and IID transmission lines in this location, for the purpose of evaluating temporary impacts, as a construction site rather than as discrete areas of activity and disturbance. (Discussion of potential impacts of the SER line in the area east and north of the IV Substation is provided below.) So regarded, the corridor would be about 2,500 feet long and 120 feet wide along the east side of the substation. Immediately north of the substation, the SER right-of-way and IID line relocation area would be adjacent to the BCP and SER work areas in an area about 600 feet long and 190 feet wide. Combined, this area of work activity on the east and north sides of the substation would be about 414,000 square feet or about 9.5 acres. It is likely that not all of this corridor would be disturbed, but for the reasons stated above, it is difficult to determine at this time precisely how much disturbance would occur, or where. This method for calculating impacts results in a conservative overestimation of the impacts in this area. The area should be considered an area of potential environmental effect within which impacts would occur to a smaller total area.

Since the SER line would be 400 to 500 feet east of the BCP line to clear the Southwest Power Link tower, it would not be included in the SDG&E/BCP corridor on the east side of the substation, so that evaluating discrete areas of temporary impact is more appropriate for the SER line along this area. At the southern dead end pole on this segment, Pole No. 1, an area centered on the pole, 90 feet wide, and 50 feet long would include both pull sites and a work area. This would amount to 4,500 feet, or about 0.1 acre. At the northeastern corner pole, Pole No. 7, an area centered on the pole and 90 feet square would include all four pull sites and a work area. This would amount to 8,100 square feet or about 0.19 acre.

Between Pole No. 1 and Pole No. 7 of the SER line, there would be three suspension poles and two pairs of A-frame structures. An additional suspension pole, No. 8, is located between corner Pole No. 7 and is within the part of the BCP/SDG&E area of potential effect directly north of the substation. A work area around each pole about 25 feet in diameter would be needed, and a work area for each pair of A-frames would need to be about 25 feet by 135 feet. The total area of work areas of these dimensions would be about 8,220 square feet or about 0.19 acre. Additional areas of temporary disturbance in this segment would result at laydown areas. A laydown area about 50 feet by 150 feet, or about 7,500 feet, would be needed at each pole location. For 7 locations on the SER line, this would total 52,500 square feet, or about 1.21 acres.

At the Southwest Power Link crossings, the static wires for the SER and BCP lines would be brought down the monopole south of the 500 kV line crossing and placed underground in a trench to cross the 500 kV line to the monopole north of the 500 kV line, and there brought back up the monopole to the upper crossarm. The trench would be relatively shallow and would be dug by hand. In the BCP/SDG&E line area, the trench temporary impacts are included in the construction corridor described above. In the SER corridor, the area of temporary impact for trenching would be about 3 feet wide and 900 feet long, about 2,700 square feet or 0.06 acre.

Permanent impacts in the monopole section of the SDG&E, BCP, SER, and IID transmission lines would result from structure footings and access roads. For suspension poles, the footings would have a surface area of about 50.24 square feet. There would be 15 suspension poles in all four lines for a total permanent impact area from suspension pole footings of about 755 square feet. Dead end or corner poles would have a footing area of about 78.5 square feet. The nine dead end or corner poles would have a total footing permanent impact area of about 707 square feet. The 16 footings for the SER crossing structures would have surface area of about 5.3 square feet each, for a total of about 85 square feet. Adding these figures, the total area of permanent impact for structure footings for all three lines would be about 1, 547 square feet, or less than 0.04 acre.

Access roads would also be areas of permanent impact. The access roads to the monopoles could be configured a number of ways. There are a number of roads already present in the area east of the substation that might be used. If it is assumed for worst-case impact assessment that all new roads would be needed to access each structure location, and that the new roads would be configured in a way to minimize impacts, a total of about 5,650 linear feet would be required to access all poles. If the access roads are 12 feet wide, this equates to approximately 67,800 square feet or less than 1.56 acres of permanent impact for access roads associated with the poles would result. Total permanent impacts for the monopole portion of the project, including the footings and access roads for the SDG&E, BCP, IID, and SER lines, would therefore be approximately 1.6 acres.

For the entire project (the moving of the SDG&E and IID lines and construction of both the BCP and SER lines), the total area of permanent impact would be approximately 3.38 acres. Discrete areas of temporary impact, as assessed above, would total approximately 5.92 acres. In addition, there would be unquantified areas of temporary impact within the 9.5-acre area of potential effect for the SDG&E and BCP lines near the IV Substation.

# APPENDIX B

# Air Quality

# Air Quality Appendix B-1
# for
# Baja California Power, Inc.
# Energía de Baja California
# Energía Azteca X

## Appendix B-1: BCP Air Quality Modeling Analysis

### I. Technical Description

The BCP transmission line would be connected to the La Rosita Power Complex (LRPC), which consists of four natural gas fired combustion turbines with associated heat recovery steam generators (HRSG) and two steam turbine generators. The LRPC is located in Mexicali, Baja California, Mexico, approximately 3 miles south of the US-Mexico border. Two of the four LRPC combustion turbines will generate a nominal 560 MW of power for export to the U.S. One combustion turbine is owned by Energía de Baja California, S. de R.L. de C.V. (EBC), and the other turbine is owned by Energía Azteca X, S. de R.L. de C.V (EAX). EAX also owns the remaining two combustion turbines that will supply power to the Comisión Federal de Electricidad (CFE) under a 25-year power purchase contract.

All four LRPC combustion turbines are Model 501F machines provided by Siemens-Westinghouse (SW). The SW machine utilizes dry, low-$NO_X$ combustion technology to reduce emissions of nitrogen oxides ($NO_X$). Additionally, two of these units will be fitted with selective catalytic reduction (SCR) technology that will further reduce the emissions of $NO_X$ from these units to a level of approximately 4 parts per million (ppm). These emission levels are well below the Mexican standards (*Norma Oficial Mexicana – 085*) of 139 ppm. In addition, these emission levels are below the latest guidelines for new power plants published by the World Bank in July 1998, which sets the limit at 155 ppm. The LRPC generation facilities will run exclusively on natural gas. The CO emissions from each of the LRPC turbines is 25 ppm.

The Project will, in accordance with specific Mexican requirements (*Norma Oficial Mexicana -- 037*), be required to operate with a continuous emissions monitoring system (CEMS) that gives real-time data on emission rates to verify that the standards are in fact being met. In addition, the project will operate a network of ambient air quality monitoring stations to be designed in conjunction with local authorities that will enhance their existing air quality monitoring systems and provide valuable information for the communities in the area relative to ambient air quality.

EAX and EBC are located on sites immediately adjacent to each other, forming the La Rosita Power Complex. The three EAX turbines are being constructed as a result of an international solicitation by the Comisión Federal de Electricidad (CFE), Mexico's national electric utility, for a power generation facility. The generation capacity of the

three EAX turbines is a nominal 750 MW.. Only one of the units operated by EAX will export power to the U.S. The other two EAX units will provide power to CFE.

## II. Air Dispersion Modeling Methodology

While the combustion technology is highly efficient and produces fewer emissions per unit of generation than technologies using other fuels, such as fuel oil or coal, the impacts on air quality require a detailed analysis to ensure that all regulations are met and that no negative health impacts are generated. Because the generation facility will not be located within the United States, U.S. Environmental Protection Agency (U.S. EPA) environmental standards do not apply. Nonetheless, BCP and its affiliates voluntarily incorporated U.S. EPA guidelines for dispersion modeling into the Air Quality Impact Assessment (AQIA) performed for the generation facility. The AQIA presented here was developed for the two export units.

Air quality impact assessments typically have the following steps:

A. Definition of existing concentrations of specific pollutants in the area of interest
B. Estimation of emissions from the project
C. Dispersion modeling to estimate the increase in ambient concentration of the specified pollutants resulting from the project emissions

Each of these steps has been performed for the generation facilities.

### II.1. Definition of existing concentrations of specific pollutants

Background concentration levels were available from monitoring stations that are operated by the U.S./Mexico Border Information Center on Air Pollution, a center run under the auspices of the U.S. EPA. Mexicali data for 1997-1998 were used to determine the background concentration levels, along with data obtained from the U.S. EPA in the United States in the border region. Table B-1.1 shows the background levels obtained.

**TABLE B1.1**
**Imperial County Maximum Background Levels**
**(micrograms per cubic meter)[1]**
*All maximum concentrations occurred at Calexico Ethel Street monitoring site.

| Averaging Period | $NO_2$ * | CO * | $PM_{10}$ * |
|---|---|---|---|
| **1-Hour** | 483.2 (1998) | 36480 (1995) | ---- |
| **8-Hour** | ---- | 26140 (1995) | ---- |
| **24-Hour** | ---- | ---- | 568 (1998) |
| **Annual** | 29.7 (1995) | ---- | 109.8 (1996) |

1 Based on Cal-EPA/Air Resources Board *California Ambient Air Quality Data 1980-1998* CD-ROM, December 1999. Values shown represent the maximum values for several air stations located in Calexico, El Centro, Niland and Westmoreland during the 1992-1998 monitoring period. Original values in parts per million were adjusted using *AP-42, Appendix A* factors.

## II.2 Estimation of Emissions

The estimated project emissions were calculated based on data from the combustion turbine and heat recovery steam generator vendors. The following table summarizes the dispersion modeling stack parameters during maximum load operations, including duct-firing of the HRSG.

**Table B2: Atmospheric Dispersion Modeling Stack Parameters**

| Turbine Type | Stack Height (m) | Stack Diameter (m) | Stack Temperature (C) | Exit Velocity (m/s) | Emission Rates per turbine (g/s) | | |
|---|---|---|---|---|---|---|---|
| | | | | | CO | $NO_2$ | $PM_{10}$ |
| EAX (gas, combined cycle) | 56 | 5.49 | 85 | 21.56 | 15.16 | 3.1 | 6.17 |
| EBC (gas, combined cycle) | 56 | 5.49 | 85 | 21.56 | 15.16 | 3.1 | 6.17 |

## II.3 Dispersion Modeling

A dispersion modeling analysis was performed using the U.S. EPA's Industrial Source Complex Short-Term 3 (ISCST3) model (Version 00101). The ISCST3 model is a steady state, multiple-source, Gaussian dispersion model and is applicable for estimating ambient impacts from point, area, and volume sources out to a distance of about 30 miles (50 kilometers), and includes algorithms for addressing building downwash influences,

dry and wet deposition, and complex terrain. The ISCST3 model includes many options to address unique modeling requirements. Some of these options are discussed below, and the options chosen for analyses performed for this proposed project are identified.

ISCST3 incorporates simple terrain algorithms for estimating impacts at receptors where ground-level elevations are equal to or less than the heights of the emission sources (stacks). To estimate impacts at receptors with ground-level elevations that exceed the final plume height centerline, the ISCST3 model incorporates complex terrain algorithms from the COMPLEX-I model. In default mode, the model follows U.S. EPA's guidance for calculation of impacts in intermediate terrain, that is, where ground-level elevations are located between the emissions release height and the final plume height centerline. For intermediate terrain receptors, the ISCST3 model calculates concentrations using both simple terrain algorithms and complex terrain algorithms. The model then compares the predicted concentrations at each receptor, on an hourly basis, and the highest concentration per receptor is output from the model. The results presented were derived from using all three terrain algorithms.

The technical options selected for the ISCST3 modeling are listed below. These are referred to as the regulatory default options in the ISCST3 Users Guide. The input options for ISCST3 are as follows:

- Final plume rise
- Buoyancy-induced dispersion
- Stack tip downwash
- Rural dispersion coefficients
- Calm processing routine
- Default wind profile exponents (rural)
- Default vertical temperature gradients
- Anemometer height = 10 meters.

### II.3.1 Meteorology

The meteorological data set deemed most representative of the Mexicali-Calexico region was five years (1990-1994) of hourly surface meteorological data collected at Imperial, California, with Holzworth seasonal average mixing height data (CARB, 2001a; Holzworth, 1972). The Imperial meteorological data set is from the National Weather Service through the CARB archives.

### II.3.2 Receptor Grids

A Cartesian receptor grid was used in the modeling analysis. The receptors extend to a distance of approximately 12 kilometers from the proposed turbine source. Beginning at the facility and moving outward, receptors were placed at 250 meter, 500 meter and 1,000 meter increments.

A refined receptor grid with 50-meter grid spacing was placed near at the border in an area where elevated concentrations were predicted. Placing a grid with 125-meter spacing around these points further refined the locations and maximum concentrations at locations south of the border.

In addition to the regularly spaced receptor grids, UTM coordinates corresponding with the ambient air quality monitoring stations were set up as receptor points in order to evaluate impacts at the locations of maximum background air pollution. Since the ambient air monitoring stations are located in generally more densely populated areas, this was done in order to compare the maximum predicted concentrations with the overall maximum predicted concentrations elsewhere on the receptor grids.

## III. Results and Conclusion

The Mexican Government and U.S. EPA have developed ambient air quality standards for several pollutants (referred to as "Criteria Pollutants"). These pollutants include nitrogen dioxide, carbon monoxide and particulate matter less than or equal to10 microns in aerodynamic diameter (PM10). If measured or predicted concentrations of the criteria pollutants are below the ambient standard, no health effects are expected. According to the ISCST3 model, the predicted increase in concentration levels of the generation facilities' emissions would not, when added to existing background levels, exceed any of the threshold safety levels established by the Mexican Government. The attached isopleth plots (Figures B1 through B5) of the model results show that the maximum impacts will occur in Mexico in areas of elevated terrain. Impacts decrease in the direction of the border and continue to decrease as the plume moves north into the United States.

The regulatory jurisdiction of the U.S. EPA does not pertain to air pollutant emissions in Mexico; nevertheless, a useful benchmark found within U.S. EPA air permitting regulations and permitting guidance can be drawn upon to help assess the significance of these predicted increases from Mexican sources at the U.S. border and points north. In the context of permitting a major source or major modification in the U.S., the U.S. EPA has established significance levels (henceforth SLs) for the criteria pollutants NO2, SO2,

and PM10 below which a major source or modification in the U.S will not be considered to cause or contribute to a violation of a NAAQS at any locality that does not meet NAAQS (40 CFR 51.165). In addition, U.S. EPA permitting guidance describes the impact area required air quality analysis to be a geographical area that exceeds these SLs. Where air dispersion modeling is performed, the U.S. EPA does not require a full impact analysis when emissions of a pollutant from a proposed source or modification would not increase ambient concentrations by more than these prescribed SLs. Thus SLs may be generally regarded as thresholds of impact below which impact is not viewed to be significant.

The combined increased pollutant concentrations resulting from emissions from the EBC and EAX export turbines are shown in Table B-1.3 (in micrograms per cubic meter). As can be seen, the pollutant levels at the U.S./Mexico border would still be well below U.S. EPA's SL thresholds. For example, the annual level of nitrogen dioxide in the U.S. receptor grid areas affected by the generation facilities tied to the proposed transmission line will be 0.15 µg/m3; the SIL for nitrogen dioxide is 1.0 µg/m3. The one-hour increase in carbon monoxide concentration levels in the U.S. will be 24.6 µg/m3; the SL is 2,000 µg/m3. For particulate matter, the 24-hour increase will be 1.7 µg/m3; the SIL is 5.0 µg/m3. The annual average increase of particulate matter will be 0.30 µg/m3 compared to an SL of 1.0 µg/m3. Thus, none of the increased concentration levels will exceed the U.S. EPA's SL.

**Table B-1.3. U.S. EPA Significance Levels, Mexican Standards, and Power Generation Facilities Project Dispersion Modeling Results (micrograms per cubic meter)**

| Pollutant | Averaging Period | Mexico Standard | Significance Level (SL) | Concentration Increase –U.S. Receptors |
|---|---|---|---|---|
| Nitrogen dioxide | 1-hour | 395 µg/m$^3$ | N/A | 4.72 µg/m$^3$ |
| Nitrogen dioxide | Annual | N/A | 1.0 µg/m$^3$ | 0.15 µg/m$^3$ |
| Carbon monoxide | 1-Hour | N/A | 2,000 µg/m$^3$ | 24.6 µg/m$^3$ |
| Carbon monoxide | 8-Hour | 12,595 µg/m$^3$ | 500 µg/m$^3$ | 10.7 µg/m$^3$ |
| Particulate matter | 24-Hour | 150 µg/m$^3$ | 5.0 µg/m$^3$ | 1.7 µg/m$^3$ |
| Particulate matter | Annual | 50 µg/m$^3$ | 1.0 µg/m$^3$ | 0.10 µg/m$^3$ |

All predicted concentration increases in the U.S. assessed at distinct points along the U.S./Mexico border and at points north of the U.S. border are below the SILs. Thus, no significant degradation of air quality is expected to occur at or north of the U.S. border as a result of the generation facilities associated with Baja California Power, Inc.'s transmission line.

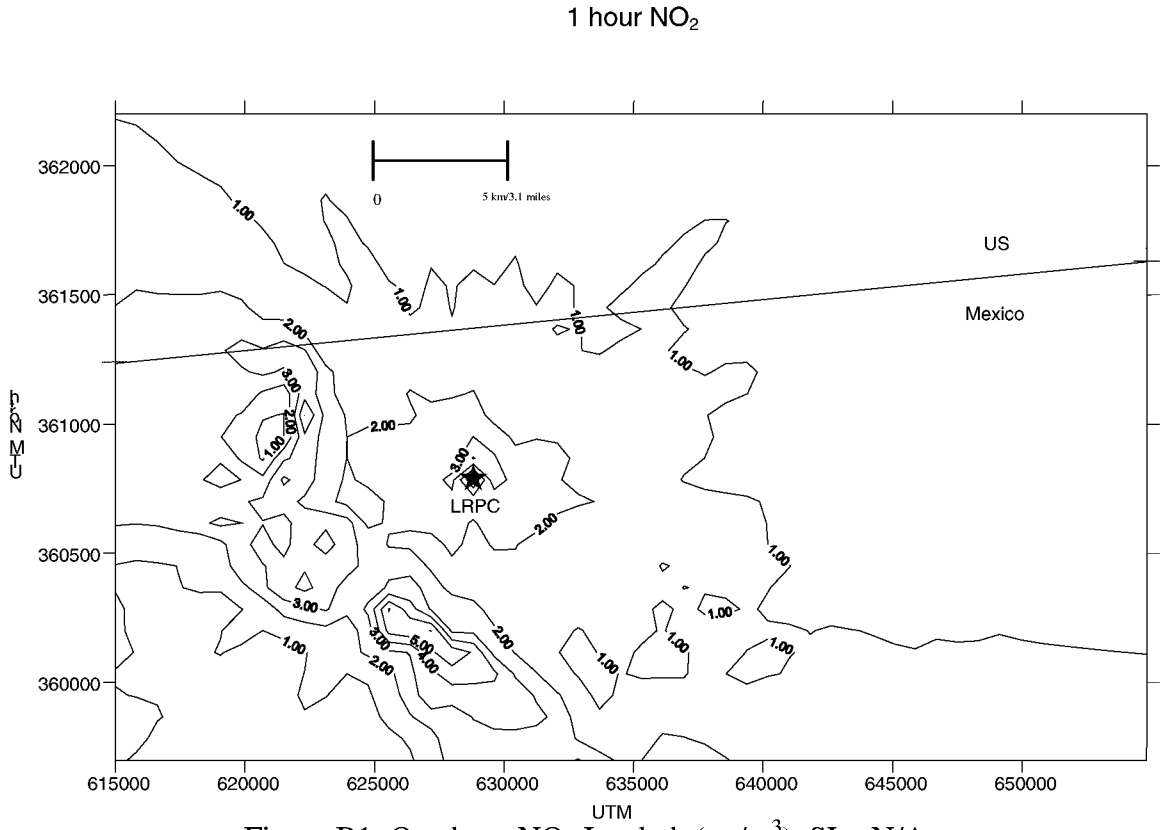



Figure B1: One hour $NO_2$ Isopleth ($\mu g/m^3$) SL: N/A

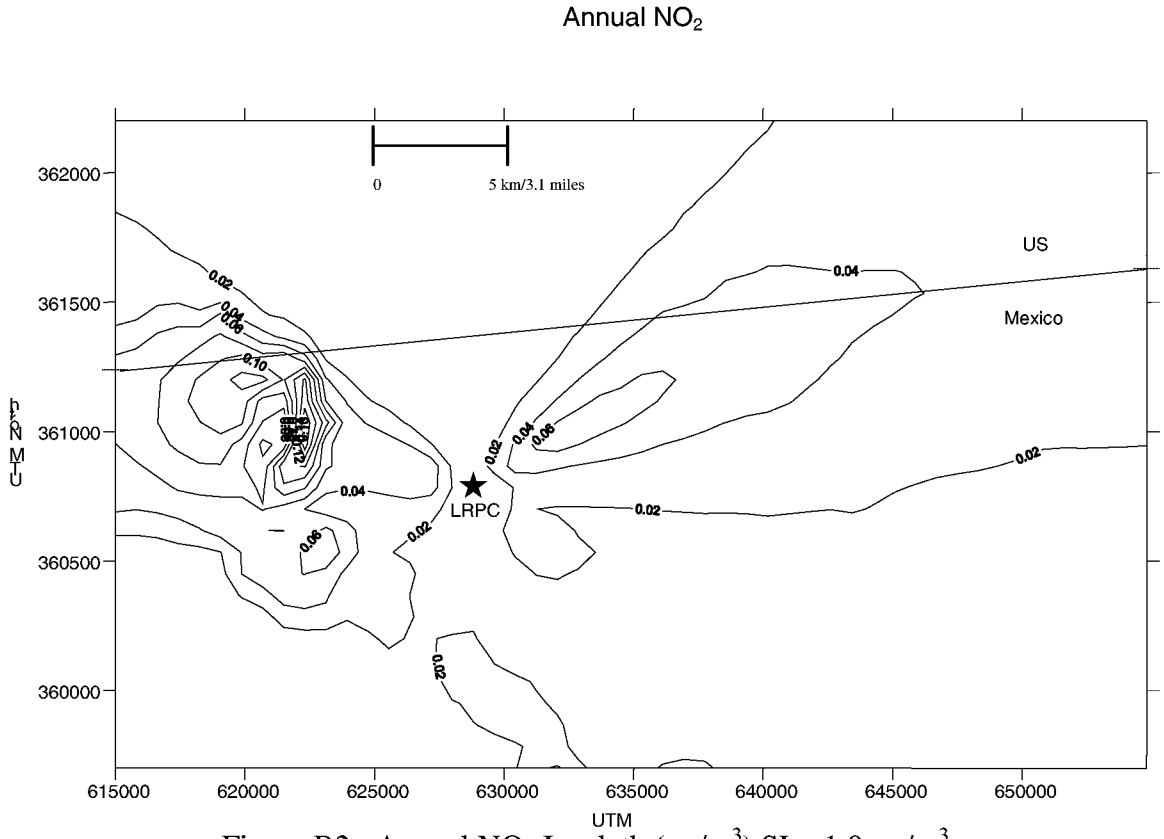



Figure B2: Annual $NO_2$ Isopleth (µg/m$^3$) SL: 1.0 µg/m$^3$

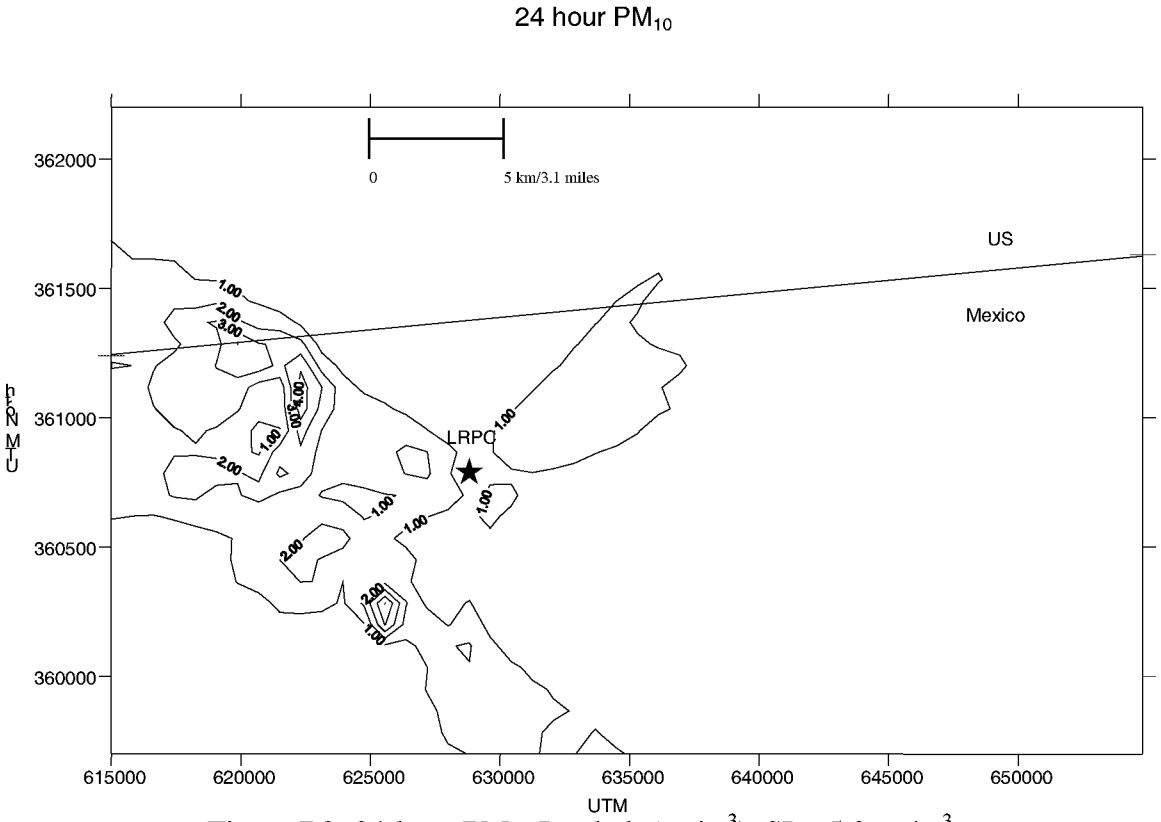



Figure B3: 24-hour $PM_{10}$ Isopleth ($\mu g/m^3$) SL: 5.0 $\mu g/m^3$

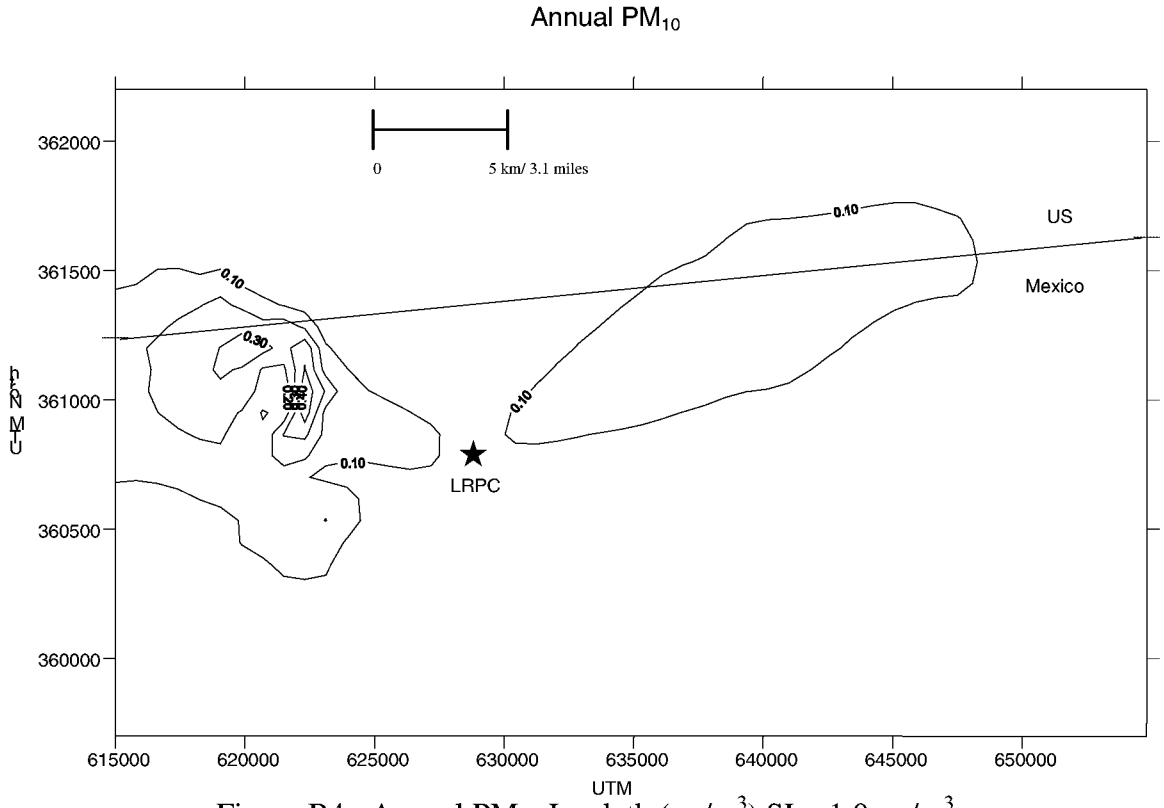



Figure B4: Annual $PM_{10}$ Isopleth ($\mu g/m^3$) SL: 1.0 $\mu g/m^3$

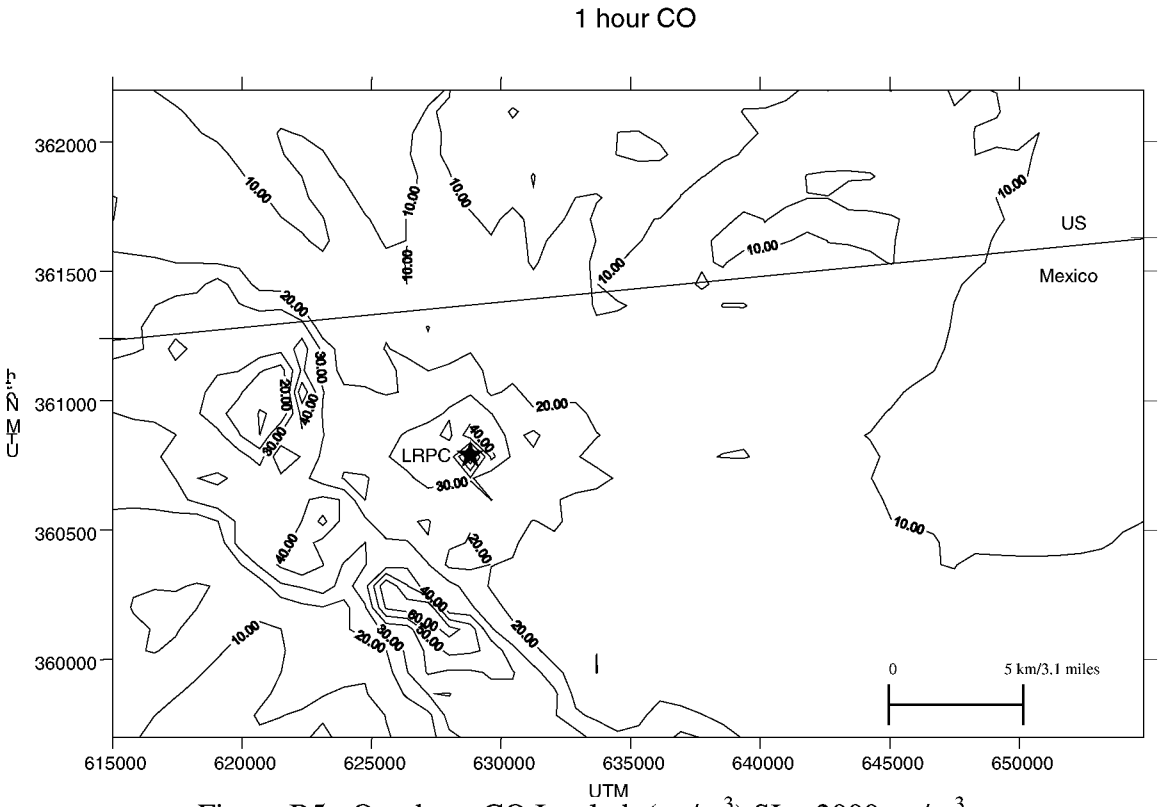



Figure B5: One-hour CO Isopleth (µg/m$^3$) SL: 2000 µg/m$^3$

# Air Quality Appendix B-2
# for
# Sempra Energy Resources
# Termoeléctrica de Mexicali Power Project

# APPENDIX B-2: SER AIR QUALITY MODELING ANALYSIS

An air dispersion modeling analysis was performed to estimate the off-site, ground-level ambient air concentrations of particulate matter ($PM_{10}$, comprised of airborne particles less than or equal to 10 microns in aerodynamic diameter), nitrogen dioxide ($NO_2$) and carbon monoxide (CO) resulting from the proposed combined cycle Termoeléctrica de Mexicali (TDM) plant located in Mexicali, Mexico.

In addition, one of the considerations that should be made in order to determine whether a pollution control project is considered environmentally beneficial, is to evaluate if potential emissions of hazardous pollutants meet existing rules or pose a threat to human health and welfare. To address this issue, an air dispersion modeling analysis was performed to estimate the off-site, ground-level ambient air concentrations of potential hazardous air pollutants (HAPs). Results of the analysis are compared with the U.S. EPA Reference Exposure Levels (RELs) and Unit Risk Factors (URFs) as indication of the potential health effects associated with the potentially hazardous air pollutants.

This section describes the modeling methodology, including the assumptions, the dispersion model, and the model input parameters that were used. The modeling methodology is based on the U.S. EPA's Guideline on Air Quality Models (incorporated as Appendix W of 40 CFR 51) and uses an U.S. EPA-approved air dispersion model.

## I. AIR DISPERSION MODELING METHODOLOGY

The U.S. EPA 1999 Guideline on Air Quality Models (GAQM) specifies the use of the U.S. EPA Industrial Source Complex Short Term (ISCST3) model for computing downwind pollutant concentrations. If the highest predicted concentrations from the analysis are within the range of acceptable criteria, then it can be reasonably assumed that the actual concentrations are well within the acceptable criteria.

The ISCST3 model, described in "Appendix B: BCP Air Quality Modeling Analysis" was used to predict the ground-level ambient air concentrations of $PM_{10}$, $NO_2$, CO, and air toxics resulting from the proposed combined cycle TDM plant.

## I.1 Model Input Parameters

The ISCST3 model requires source specific stack parameters as input to the model. These parameters include stack height, stack diameter, flue gas exit temperature, volumetric flow, and pollutant emission rate. Additional site-specific input parameters include building dimensions for the dominant building producing downwash and characterization of the surrounding terrain. Terrain elevation input to the model is discussed in subsection I.2. Both heat recovery steam generators (HRSG) were modeled to determine cumulative impacts. Table B-2.1 presents the stack parameters based on operation of both HRSGs.

## I.2 Terrain

Modeling runs were performed with both simple terrain only and complex terrain only. Simple terrain does not take terrain elevations into consideration. Complex terrain allows for elevated terrain height. The terrain elevations used as input into the ISCST3 model were taken from a digital elevation map of the proposed site location. Modeling receptor locations were determined by using a multi-tier grid with different tier spacing. The grid was defined according to the 1998 U.S. EPA Office of Solid Waste (OSW) Human Health Risk Assessment Protocol (HHRAP) and the 1999 U.S. EPA OSW Screening Level Ecological Risk Assessment Protocol (SLERAP). The grid is defined by two tiers. The first tier is a 100-meter spaced grid from the centroid of the emission sources out to a radius of 3 km. The second tier is a 500-meter spaced grid extending from 3 km to 10 km.

## I.3 Meteorology

The ISCST3 model was run using two years (1997 and 1998) of meteorological data from the four California Air Resources Board (CARB) Monitoring Stations located in Mexicali, Mexico. It was necessary to use four stations in order to obtain all of the required parameters for the modeling analysis, as none of the meteorological monitoring sites had a complete set of data. Specifically, the most complete set of data was used as the basis for the meteorological data set, and was augmented, where necessary, with data from the other three stations. Site specific meteorology is a key determinant in the identification of potential impacts. The analysis takes into account hourly wind data (i.e., direction and velocity) for each hour of the year and computes 24-hour concentrations for $PM_{10}$, and annual concentrations for $PM_{10}$ and air toxics. Hourly concentrations for CO, $NO_2$, and air toxics and 8-hour concentrations for CO were also calculated.

## II. RESULTS

The ISCST3 air dispersion model was used to perform an air dispersion analysis to estimate the off-site, ground-level ambient air concentrations of $PM_{10}$, $NO_2$, CO and air toxics resulting from the proposed combined cycle Termoeléctrica de Mexicali plant. Ground-level concentrations were determined, based on the simultaneous operation of both HRSGs at full load operation, when firing natural gas. The output data from the air dispersion modeling analysis are attached to the end of this Appendix and the results are summarized in Table B-2.2 with the applicable thresholds.

**Table B-2.1**
**MODELING INPUT PARAMETERS [a]**

| Parameter | HRSG1 | HRSG2 |
|---|---|---|
| Stack Height (m) | 51.8 | 51.8 |
| Stack Diameter (m) | 5.5 | 5.5 |
| Exit Temperature (°C) | 87 | 87 |
| Stack Outlet Flow ($m^3$/hr) | 1,711,200 | 1,711,200 |
| Criteria Pollutant Emission rates (kg/hr) | | |
| $PM_{10}$ | 12.3 | 12.3 |
| $NO_2$ | 9.7 | 9.7 |
| CO | 9.4 | 9.4 |
| Non-criteria Pollutant Emission Rates (kg/hr)[b] | | |
| Acetaldehyde | 0.061 | 0.061 |
| Ammonia | 14.3 | 14.3 |
| Benzene | 0.013 | 0.013 |
| 1,3-butadiene | 0.00013 | 0.00013 |
| Formaldehyde | 0.010 | 0.010 |
| Hexane | 0.22 | 0.22 |
| PAHs | 0.00043 | 0.00043 |
| Toluene | 0.065 | 0.065 |
| Xylene | 0.022 | 0.022 |
| Cyanide | 0.000039 | 0.000039 |
| Mercury | 0.00000039 | 0.00000039 |

**Downwash Building Dimensions**

| Building | Building Height (m) | Min. Horizontal Dimension (m) | Max. Horizontal Dimension (m) |
|---|---|---|---|
| HRSG | 32.0 | 7.3 | 48.2 |
| Cooling Tower | 17.7 | 32.9 | 113 |
| Control Building | 4.0 | 22.0 | 27.5 |
| Warehouse | 7.0 | 18.0 | 28.0 |
| Service Water/Fire Water Storage Tank | 13.1 | 36.6 (diameter) | -- |
| Combustion Turbine, ea. | 18.6 | 14.6 | 31.7 |
| Steam Turbine | 17.1 | 14.0 | 32.6 |
| Administration Building | 4.0 | 22.0 | 22.0 |

[a] *All stack parameters are based on maximum load operation.*
[b] *Non-criteria pollutant emissions based on Ca Air Toxic Emission Factor (CATEF) Database, Ca Air Resources.*
*Source: PCR Services Corporation, April 2001.*

## II.1 Comparison of Concentrations with Criteria Pollutant Standards

Modeling results and a comparison to Mexico's national air quality standards are summarized in Table B-2.2. The results indicate that the maximum project impacts are predicted to range from 0.09 to 7.1 percent of the applicable Mexican air quality standards for

**Table B-2.2**

**RESULTS OF THE AIR DISPERSION MODELING ANALYSIS COMPARED TO MEXICO AMBIENT AIR QUALITY STANDARDS**

| | | Predicted Impacts and Thresholds | | | |
|---|---|---|---|---|---|
| Averaging Period | Mexico National Standard | Project Peak Complex Terrain | % of Mexico Standard | Project Peak Simple Terrain | % of Mexico Standard |
| **MAXIMUM CONCENTRATIONS** | | | | | |
| $PM_{10}$ | | | | | |
| 24-hour | 150 µg/m3 | 7.17 µg/m3 | 4.78 | 1.212 µg/m3 | 0.81 |
| Annual | 50 µg/m3 | 0.75 µg/m3 | 1.50 | 0.0475 µg/m3 | 0.10 |
| CO | | | | | |
| 8-hour | 11 ppm | 0.010 ppm | 0.09 | 0.0022 ppm | 0.02 |
| 8-hour | | 11.51 µg/m3 | | 2.54 µg/m3 | |
| $NO_2$ | | | | | |
| 1-hour | 0.21 ppm | 0.015 ppm | 7.14 | 0.00519 ppm | 2.47 |
| 1-hour | | 27.47 µg/m3 | | 9.76 µg/m3 | |
| Annual | | 0.588 µg/m3 | | 0.037 µg/m3 | |
| **MAXIMUM BORDER AND NORTH OF THE BORDER CONCENTRATIONS** | | | | | |
| $PM_{10}$ | | | | | |
| 24-hour | 150 µg/m3 | 1.198 µg/m3 | 0.79 | 0.885 µg/m3 | 0.59 |
| Annual | 50 µg/m3 | 0.114 µg/m3 | 0.23 | 0.038 µg/m3 | 0.076 |
| CO | | | | | |
| 8-hour | 11 ppm | 0.0019 ppm | 0.02 | 0.00097 ppm | 0.0088 |
| 8-hour | | 2.16 µg/m3 | | 1.12 µg/m3 | |
| $NO_2$ | | | | | |
| 1-hour | 0.21 ppm | 0.003 ppm | 1.43 | 0.0019 ppm | 0.90 |
| 1-hour | | 6.00 µg/m3 | | 3.48 µg/m3 | |
| Annual | | 0.0899 µg/m3 | | 0.030 µg/m3 | |

*Source: PCR Services Corporation, September 2001.*

complex terrain and less than 2.5 percent of the standards for simple terrain. Therefore, this analysis has demonstrated that the project meets Mexico's air quality requirements. Figures B6 through B8 provide a graphic presentation of the modeling results with complex terrain. Peak concentrations for the annual averaging period occur approximately 5 kilometers to the northwest, and peak concentrations for 1-hour averaging period occur approximately 3

kilometers to the southwest. Both 8-hour and 24-hour concentrations occur approximately 4 kilometers due west of the project site. Table B-2.2 also presents maximum concentrations to be experienced at the International Border between the United States and Mexico.

## II.2 Comparison of Maximum Air Pollutant Increases to Significance Levels (SLs)

The regulatory jurisdiction of the U.S. EPA does not pertain to air pollutant emissions in Mexico; nevertheless, a useful benchmark in U.S. EPA air permitting regulations and permitting guidance can be drawn upon to help assess the significance of these predicted increases from Mexican sources at the U.S. border and points north. In the context of permitting a major source or major modification in the U.S., the U.S. EPA has established significance levels (henceforth SLs) for the criteria pollutants $NO_2$, $SO_2$, and $PM_{10}$ below which a major source or modification will not be considered to cause or contribute to a violation of a National Ambient Air Quality Standard (NAAQS) at any locality that does not meet NAAQS *(40 CFR 51.165)*. In addition, U.S. EPA permitting guidance describes the impact area required air quality analysis to be a geographical area that exceeds these SLs. Where air dispersion modeling is performed, the U.S. EPA does not require a full impact analysis when emissions of a pollutant from a proposed source or modification would not increase ambient concentrations by more than these prescribed SLs. Thus SLs may be generally regarded as thresholds of impact below which impact is not viewed to be significant.

Table B-2.3 presents the maximum air pollutant increases predicted by the ISCST3 complex terrain algorithm compared to U.S. EPA SLs.

**Table B-2.3 Comparison of Maximum Air Pollutant Increases to SLs**

| Pollutant | Averaging Period | Significance Level (SL) | Concentration Increase at U.S. Receptors* |
|---|---|---|---|
| Nitrogen dioxide | 1-hour | N/A | 6.00 $\mu g/m^3$ |
| Nitrogen dioxide | Annual | 1.0 $\mu g/m^3$ | 0.09 $\mu g/m^3$ |
| Carbon monoxide | 8-hour | 500 $\mu g/m^3$ | 2.16 $\mu g/m^3$ |
| Particulate matter | 24-hour | 5.0 $\mu g/m^3$ | 1.12 $\mu g/m^3$ |
| Particulate matter | Annual | 1.0 $\mu g/m^3$ | 0.11 $\mu g/m^3$ |

As can be seen from the table, the ISCST3 air dispersion modeling analysis demonstrates that TDM's air quality impacts at the international border are below U.S. EPA SL values. Impacts further away from the international border and thus further away from the TDM facility would be lower than those along the border.

## II.3 Potential Health Effects

Health effects resulting from exposure to toxic air contaminants can be categorized as either carcinogenic (cancer-causing), or non-carcinogenic. Health effects from carcinogenic air toxics are usually described in terms of individual cancer risk. "Individual cancer risk" is the likelihood that a person exposed to concentrations of toxic air contaminants (TACs) over a 70-year lifetime will contract cancer, based on the use of standard risk assessment methodology. These cancer risks are based on the best estimates of plausible cancer potencies as determined by industry standards. When exposure to more than one potential carcinogen is evaluated, the risks posed by the various individual air toxics are summed; this sum is the overall cancer risk estimate.

Non-carcinogenic health effects associated with air toxics vary depending on the types and quantities of air toxics exposure. Adverse effects on health, as well as the potential for nuisance and other forms of irritation, depend largely on the susceptibility of the individual, and are evaluated for two different periods of exposure: acute (short-term exposure) and chronic (long-term exposure). Non-cancer health effects (both acute and chronic) are considered by comparing estimated exposure levels to known or estimated thresholds (termed "reference exposure levels" or RELs).

For health risk assessments, computer modeling is carried out to determine the magnitude and location of the highest estimated ground-level concentrations of TACs emitted from the facility. The hypothetical maximum exposed individual (MEI), whose exposure is used to evaluate the worst-case exposure level, would be located at this point. In residential areas, this MEI is assumed to be exposed to TAC emissions for 24 hours per day, 365 days per year, for 70 years. These levels of exposure are highly unlikely in actual situations, and are typical of standard conservative health risk assessment assumptions.

For carcinogens, the health risk at the MEI receptor is expressed as ten chances in a million that an individual would contract cancer if he or she were exposed to the estimated concentration for 70 years. Health risks associated with exposure to carcinogenic compounds from a facility can be defined in terms of the probability of developing cancer as a result of exposure to a chemical at a given concentration. The cancer risk probability is determined by multiplying the chemical's annual concentration by its carcinogenic potential or unit risk factor (URF). The URF is a measure of the carcinogenic potential of a chemical when a dose is received through the inhalation pathway. It represents an upper bound estimate of the probability of contracting cancer as a result of continuous exposure to an ambient concentration of one microgram per cubic meter ($\mu g/m^3$) over a 70-year lifetime.

An evaluation of the potential non-cancer effects of chemical exposures was also conducted. For non-cancer health effects, the potential for human health hazards is evaluated

by calculating ratios, also know as hazard indices, which compare the estimated level of exposure for various substances to reference doses. Reference doses for non-cancer contaminants are levels established by the scientific community and by governmental agencies responsible for protecting human health. Reference doses for some substances are based on observed effects on laboratory animals. The reference doses for humans are usually based on calculations, in which a 100-fold safety factor is applied to "no observed effects level" (NOEL). When the ratio of the estimated concentration to the reference dose is less than 0.5, no health effect would be anticipated. In a conservative analysis, the ratios for the various substances considered are added together to obtain a "hazard index," which, when less than 0.5, would indicate no health effect.

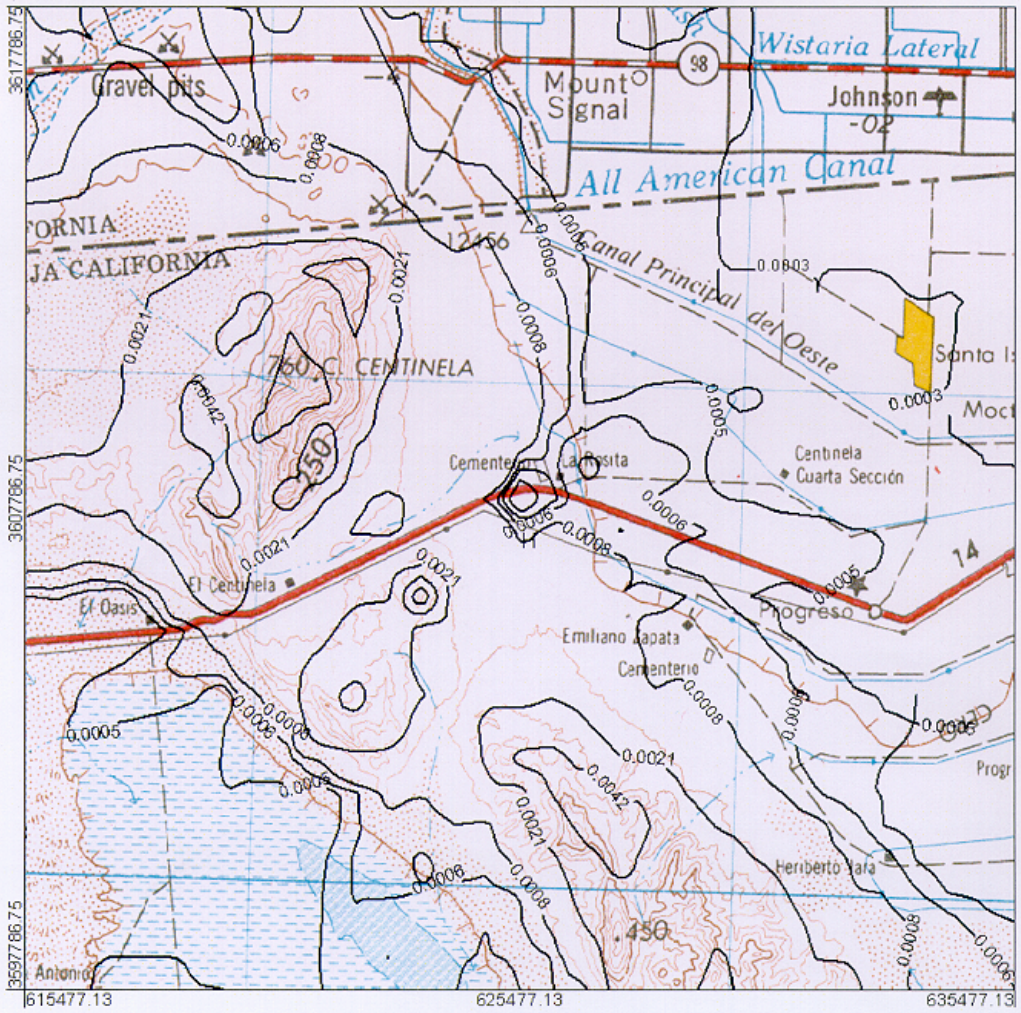
The analysis of project related health impacts was performed for potential acute, chronic and cancer health effects. Maximum emission rates of hazardous air pollutants, also referred to as non-criteria pollutants, that could be potentially emitted during operation of the proposed project are presented in Table B-2.2. The HAPs were modeled to determine their maximum potential ground level concentration for both the 1-hour and annual averaging period. The 1-hour concentration was then compared to the relevant reference exposure levels (RELs) to determine potential acute health effects.

## III. CONCLUSIONS

The project will not cause substantial increases in any of the modeled pollutants in comparison to their relative standards. The project related maximum ambient increase is only 7 percent for the maximum 1-hour $NO_2$ concentration, and substantially smaller for all other pollutants and averaging periods. Predicted increases of air pollutants are less than U.S. EPA significance levels that can be viewed as benchmarks below which impact is not considered significant. Project related health effects for cancer risk, and both acute and chronic health effects, are substantially below their relative thresholds of 10 in 1 million, 0.5 and 0.5, respectively. Therefore, the proposed project will not have a substantial impact on ambient pollutant concentrations, nor is it expected to pose a significant health impact on the region surrounding the project site.

# CO 8-Hr Concentrations (ppm)

PROJECT NAME:
**SEMPRA Mexicali Power Plant**
**PLOT FILE OF HIGH 1ST HIGH 8-HR VALUES FOR SOURCE GROUP: ALL**




| MODELING OPTIONS: | | | COMPANY NAME: | |
|---|---|---|---|---|
| CONC, RURAL, ELEV, DFAULT, PPM | | | | |
| OUTPUT TYPE: | RECEPTORS: | COMMENTS: | MODELER: | 0 4 km |
| CONC | 5237 | H=HRSG Stacks Location | | |
| MAX: | UNITS: | | DATE: | PROJECT/PLOT NO.: |
| 0.0101 | ppm | | 8/28/2001 | |

ISC-AERMOD View by Lakes Environmental Software

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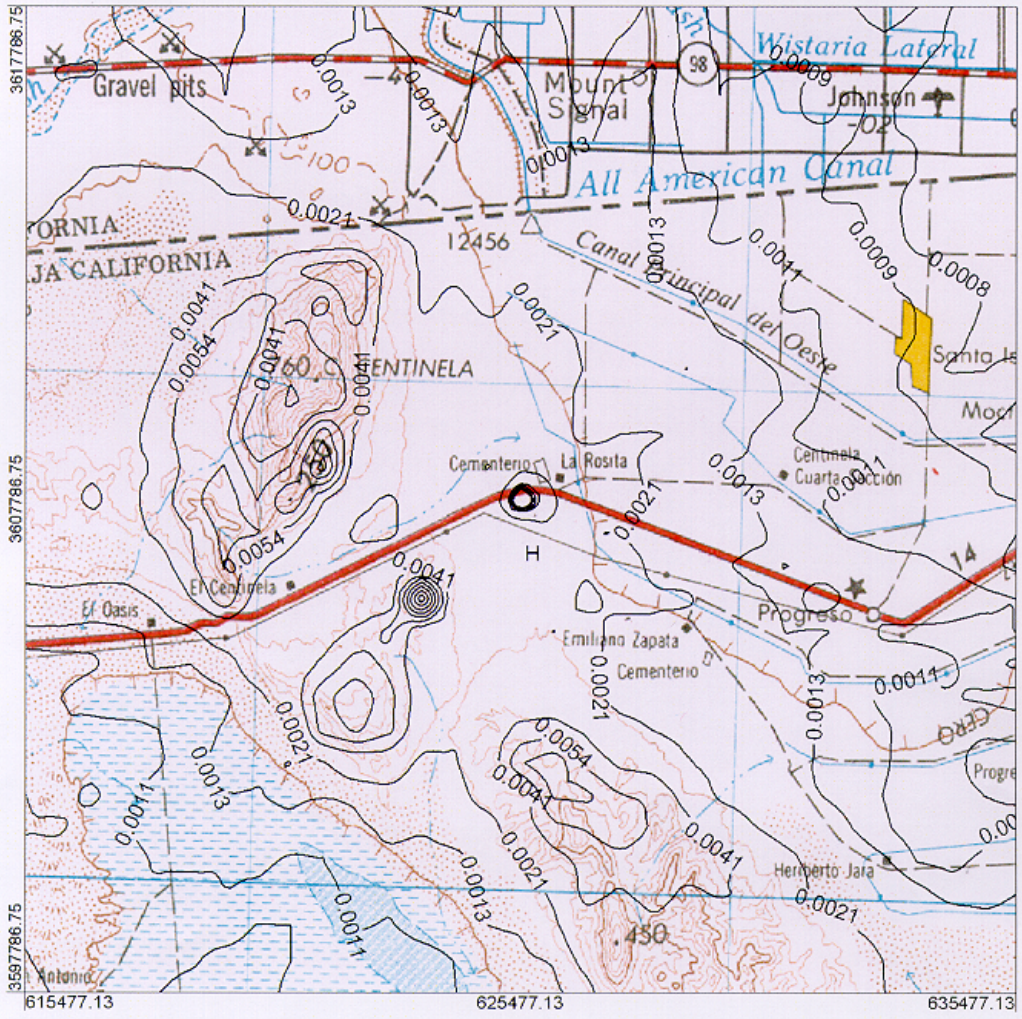
# $NO_2$ 1-HR Concentrations (ppm)

PROJECT NAME:
**SEMPRA Mexicali Power Plant**
**PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL**

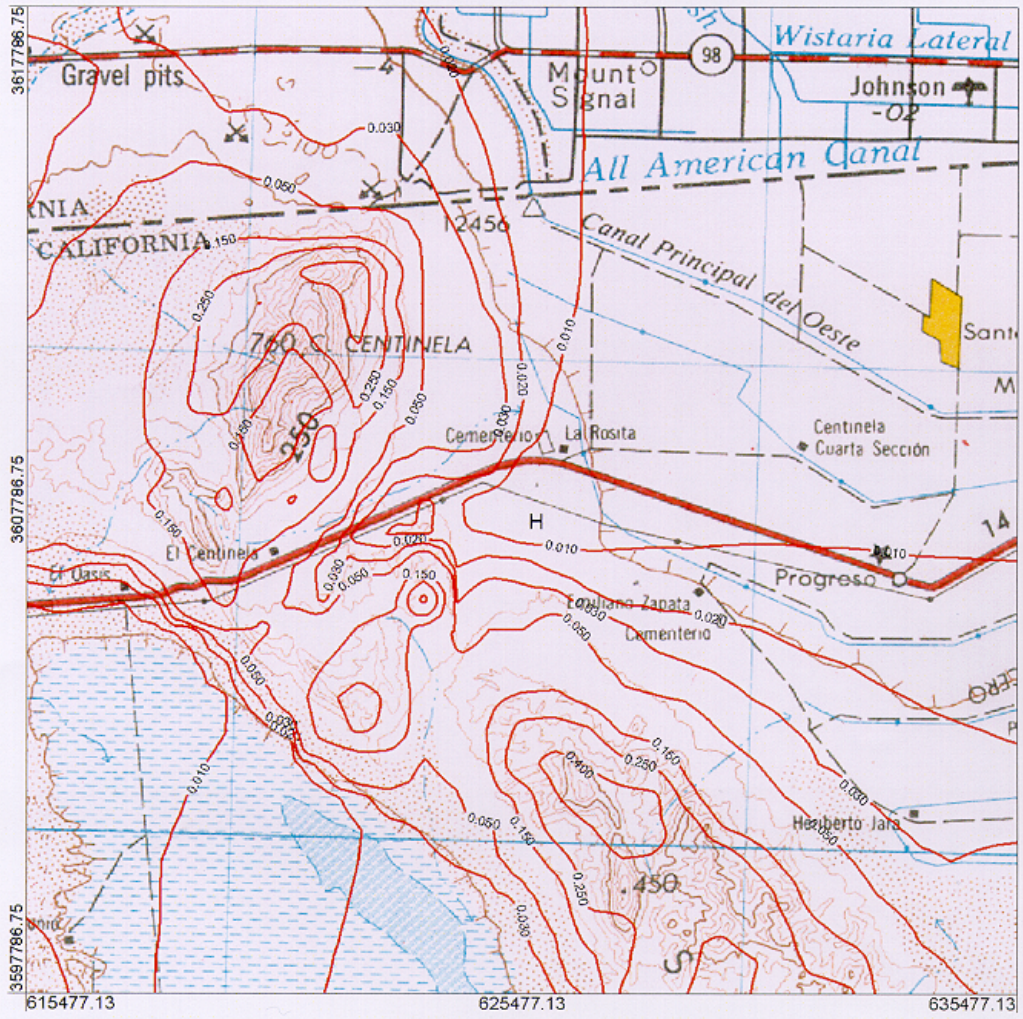



| MODELING OPTIONS: | | | COMPANY NAME: | |
|---|---|---|---|---|
| **CONC, RURAL, ELEV, DFAULT, PPM** | | | | |
| OUTPUT TYPE: **CONC** | RECEPTORS: **5237** | COMMENTS: H=HRSG Stacks Location | MODELER: | 0 — 4 km |
| MAX: **0.0146** | UNITS: **ug/m**3** | | DATE: **8/28/2001** | PROJECT/PLOT NO: |

ISC-AERMOD View by Lakes Environmental Software — V:\PROJECTS\AIR QUALITY DIVISION\PROJECTS\MEXICALI\REVISED MEXICALI\MEXNO2US.PLT

# $PM_{10}$ Annual Concentrations ($\mu g/m^3$)

PROJECT NAME:
**SEMPRA Mexicali Power Plant**
**PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL**




| MODELING OPTIONS: | | | COMPANY NAME: | |
|---|---|---|---|---|
| **CONC, RURAL, ELEV, DFAULT** | | | | |
| OUTPUT TYPE: | RECEPTORS: | COMMENTS: | MODELER: | 0 4 km |
| **CONC** | **5237** | H=HRSG Stacks Location | | |
| MAX: | UNITS: | | DATE: | PROJECT/PLOT NO.: |
| **0.74576** | **ug/m**3** | | **4/19/2001** | |

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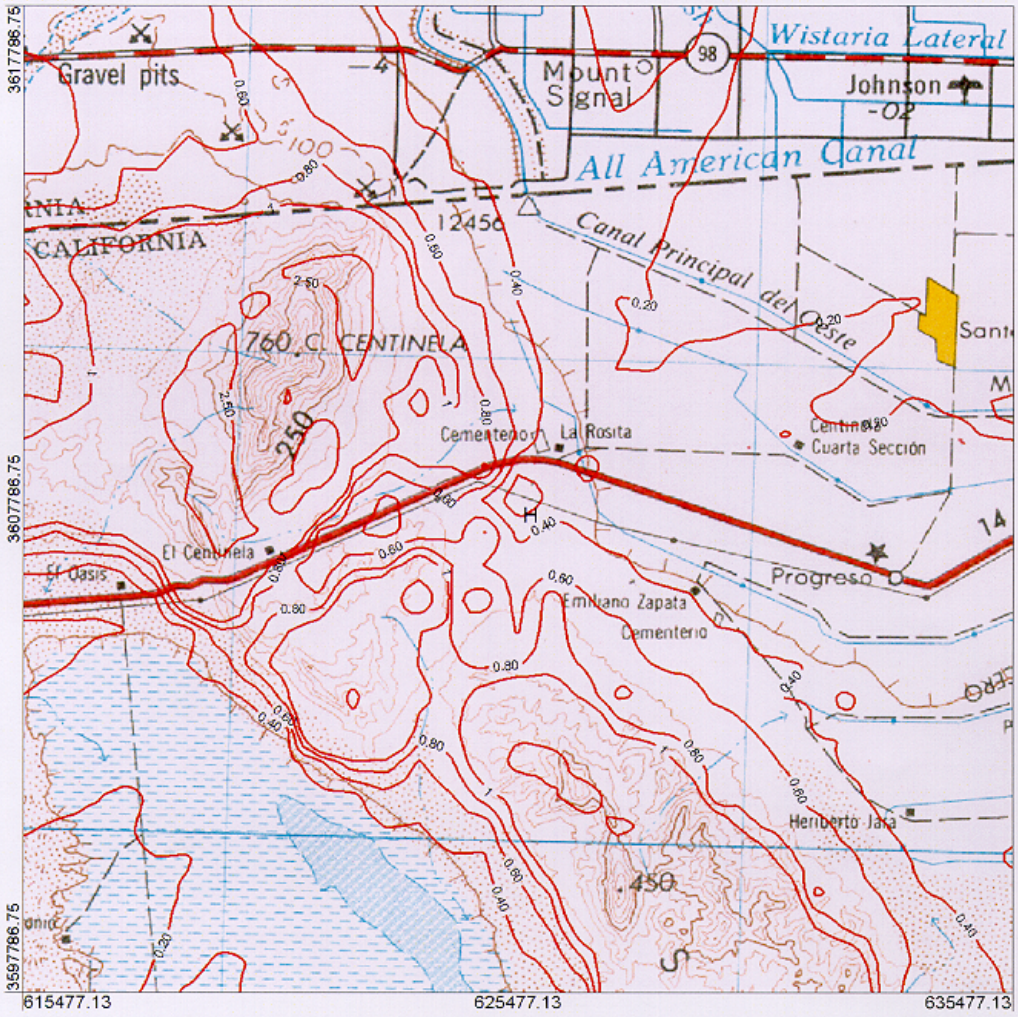
# $PM_{10}$ 24-HR Concentrations ($\mu g/m^3$)

PROJECT NAME:
**SEMPRA Mexicali Power Plant**
**PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL**




| MODELING OPTIONS: | | | COMPANY NAME: | |
|---|---|---|---|---|
| **CONC, RURAL, ELEV, DFAULT** | | | | |
| OUTPUT TYPE: | RECEPTORS: | COMMENTS: | MODELER: | 0 4 km |
| **CONC** | **5237** | H=HRSG Stacks Location | | |
| MAX: | UNITS: | | DATE: | PROJECT/PLOT NO.: |
| **7.17288** | **ug/m**3** | | **4/19/2001** | |

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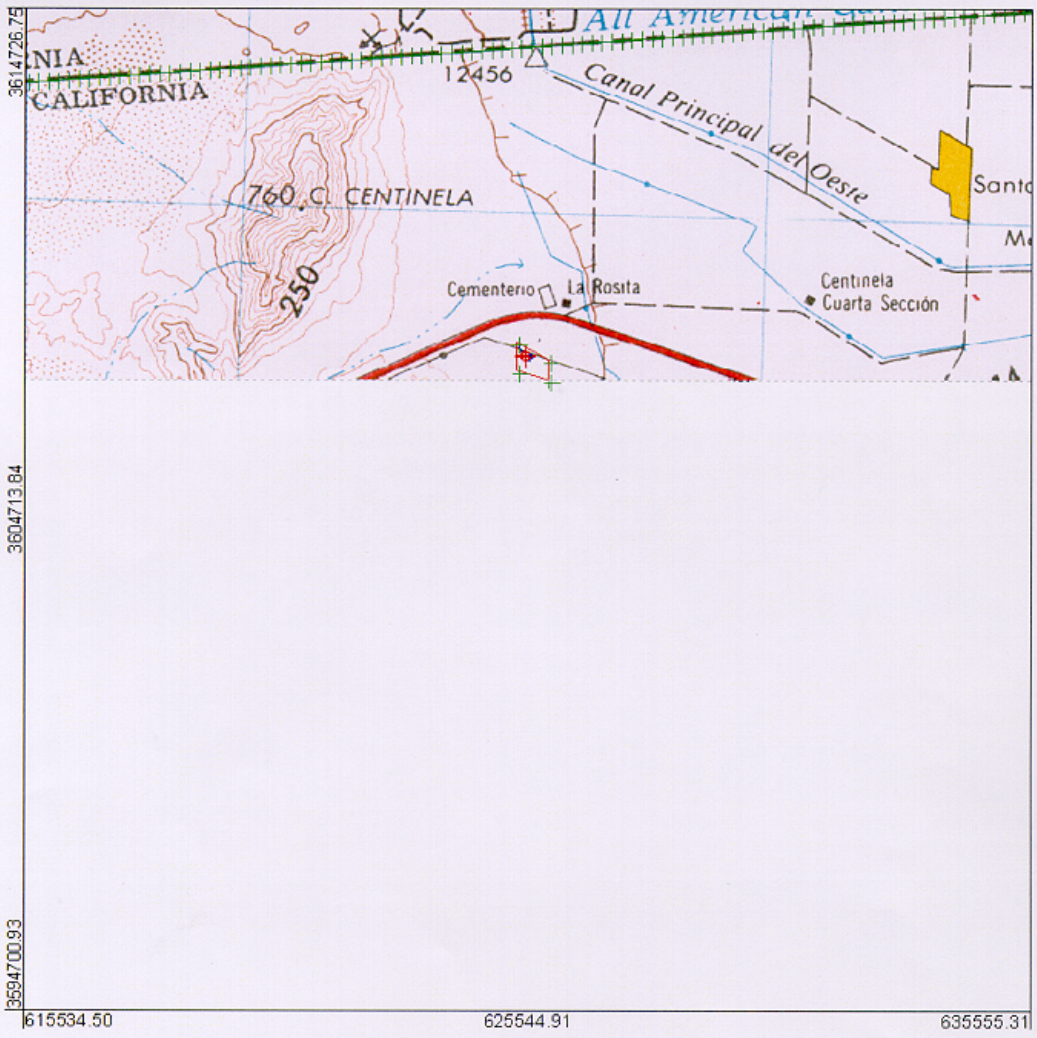
PROJECT NAME:
**SEMPRA Mexicali Power Plant**
**U.S. - Mexico Border and Fenceline Receptors**

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| MAX: | UNITS: | | DATE: 4/12/2001 | PROJECT/PLOT NO.: |

ISC-AERMOD View by Lakes Environmental Software

U.S. – Mexico Border and Fenceline Receptors

# Air Quality Appendix B-3
# for Combined
# Baja California Power and
# Sempra Energy Resources

## Appendix B-3: Combined Air Quality Modeling Analysis

### I. Technical Description of Combined Facilities

To determine the combined impacts of the TDM facility and the two LRPC export units, air dispersion modeling was conducted utilizing the U.S. Environmental Protection Agency's Industrial Source Complex Short-Term 3 (ISCST3) model (Version 00101). The ISCST3 model is a steady state, multiple-source, Gaussian dispersion model, as described earlier. Detailed descriptions of the components of the Termoeléctrica de Mexicali (TDM) and La Rosita Power Complex (LRPC) power plants are contained in previous sections of this Appendix.

The TDM and the LRPC power plants have emission levels that are well below the Mexican standards (*Norma Oficial Mexicana – 085*) of 139 ppm. In addition, these emission levels are below the latest guidelines for new power plants published by the World Bank in July 1998, which sets the limit at 155 ppm. Both the TDM and LRPC generation facilities will run exclusively on natural gas.

### II. Air Dispersion Modeling Methodology

This combined air quality impact assessment incorporated U.S. EPA guidelines for dispersion modeling.

Air quality impact assessments typically utilize the following information and data:

A. Definition of existing concentrations of specific pollutants in the area of interest;
B. Predicted emissions from the projects/sources;
C. Physical project characteristics;
D. Physical characteristics of surrounding terrain;
E. Dispersion modeling to estimate the increase in ambient concentration of the specified pollutants resulting from the project emissions

Each of these steps has been performed for the TDM and the LRPC export units combined.

### II.1 Definition of Existing Concentrations of Specific Pollutants

Background ambient air quality concentration levels are available from monitoring stations operated by the U.S./Mexico Border Information Center on Air Pollution, a center run under the auspices of the U.S. EPA. Mexicali data for 1997-1998 were used to

determine background ambient air quality, along with data obtained from the U.S. EPA. Table B-3.1 shows the background ambient air quality levels.

**TABLE B-3.1**
**Imperial County Maximum Background Levels**
**(micrograms per cubic meter)[1]**
*All maximum concentrations occurred at Calexico Ethel Street monitoring site.

| Averaging Period | $NO_2$* | CO* | $PM_{10}$* |
|---|---|---|---|
| **1-Hour** | 483.2 (1998) | 36480 (1995) | ---- |
| **8-Hour** | ---- | 26140 (1995) | ---- |
| **24-Hour** | ---- | ---- | 568 (1998) |
| **Annual** | 29.7 (1995) | ---- | 109.8 (1996) |

1 Based on Cal-EPA/Air Resources Board *California Ambient Air Quality Data 1980-1998* CD-ROM, December 1999. Values shown represent the maximum values for several air stations located in Calexico, El Centro, Niland and Westmoreland during the 1992-1998 monitoring period. Original values in parts per million were adjusted using *AP-42, Appendix A* factors.

## II.2 Estimation of Emissions

The estimated project emissions were calculated based on data from the combustion turbine and heat recovery steam generator vendors.

## II.3 Dispersion Modeling

The ISCST3 model includes many options to address unique modeling requirements. Some of these options are discussed below, and the options chosen for analyses performed for this proposed project are identified.

ISCST3 incorporates simple terrain algorithms for estimating impacts at receptors where ground-level elevations are equal to or less than the heights of the emission sources (stacks). To estimate impacts at receptors with ground-level elevations that exceed the final plume height centerline, the ISCST3 model incorporates complex terrain algorithms from the COMPLEX-I model. In default mode, the model follows U.S. EPA's guidance for calculation of impacts in intermediate terrain, that is, where ground-level elevations are located between the emissions release height and the final plume height centerline. For intermediate terrain receptors, the ISCST3 model calculates concentrations using both simple terrain algorithms and complex terrain algorithms. The model then compares the predicted concentrations at each receptor, on an hourly basis, and the highest concentration per receptor is output from the model. The results presented were derived from using all three terrain algorithms.

The technical options selected for the ISCST3 modeling are listed below. These are referred to as the regulatory default options in the ISCST3 User' Guide. These are the options that U.S.-based regulatory agencies typically require be used when conducting air dispersion modeling. The input options for ISCST3 are as follows:

- Final plume rise
- Buoyancy-induced dispersion
- Stack tip downwash
- Rural dispersion coefficients
- Calm processing routine
- Default wind profile exponents (rural)
- Default vertical temperature gradients
- Anemometer height = 10 meters.

### II.3.1 Meteorology

Several meteorological data sets were evaluated for this analysis. The meteorological data set deemed most representative of the Mexicali-Calexico region was five years (1990-1994) of hourly surface meteorological data collected at Imperial, California, with Holzworth seasonal average mixing height data (California Air Resources Board [CARB], 2001a; Holzworth, 1972). The Imperial meteorological data set is from the National Weather Service through the CARB archives.

### II.3.2 Receptor Grids

A Cartesian receptor grid was used in the modeling analysis. The receptors extend to a distance of approximately 8½ miles (12 km) from the proposed turbine sources. Beginning at the facilities and moving outward, receptors were placed at 250 meter, 500 meter, and 1,000 meter increments.

A refined receptor grid with 50-meter grid spacing was placed at the border in an area where elevated concentrations may be predicted. Placing a grid with 125-meter spacing around these points provides further refinement to help determine maximum concentrations along the border.

## III. Results and Conclusion

The Mexican Government and U.S. EPA have developed ambient air quality standards for several pollutants (referred to in the U.S. by EPA as "Criteria Pollutants"). These include standards for nitrogen dioxide, carbon monoxide and particulate matter equal to or less than 10 microns in aerodynamic diameter ($PM_{10}$). If measured or predicted concentrations of criteria pollutants are below the ambient air quality standard, no health effects are expected, since ambient air quality standards are set at levels intended to be protective of health and the environment.

The combined increased pollutant concentrations resulting from air emissions from the TDM and the LRPC export facilities (four turbines in all) are shown in Table CAQMA.2 (in micrograms per cubic meter). Annual averages represent the maximum predicted value for any year. Based on the model results, the predicted increase in concentration levels as a result of the generation facilities' emissions would not, when added to existing background levels, exceed any of the ambient air quality standards established by either the Mexican Government or the U.S. EPA for their respective jurisdictions.

The regulatory jurisdiction of the U.S. EPA does not pertain to air pollutant emissions in Mexico; nevertheless, a useful benchmark in U.S. EPA air permitting regulations and permitting guidance can be drawn upon to help assess the significance of these predicted increases from Mexican sources at the U.S. border and points north. In the context of permitting a major source or major modification in the U.S., U.S. EPA has established significance levels (henceforth SLs) for the criteria pollutants $NO_2$, $SO_2$, CO, and $PM_{10}$ below which a major source or modification in the U.S. will not be considered to cause or contribute to a violation of a National Ambient Air Quality Standard (NAAQS) at any locality that does not meet NAAQS *(40 CFR 51.165)*. In addition, U.S. EPA permitting guidance describes the impact area required air quality analysis to be a geographical area that exceeds these SLs. Where air dispersion modeling is performed, the U.S. EPA does not require a full impact analysis when emissions of a pollutant from a proposed source or modification would not increase ambient concentrations by more than these prescribed SLs. Thus SLs may be generally regarded as thresholds of impact below which impact is not viewed to be significant. Table B-3.2 shows applicable U.S. EPA SLs and the predicted concentration increases at U.S. receptors.

**Table B-3.2. U.S. EPA Significance Levels (SLs) and Power Generation Facilities Project Dispersion Modeling Results (micrograms per cubic meter)**

| Pollutant | Averaging Period | Significance Level (SL) | Concentration Increase at U.S. Receptors |
|---|---|---|---|
| Nitrogen dioxide | 1-hour | N/A | 7.04 $\mu g/m^3$ |
| Nitrogen dioxide | Annual | 1.0 $\mu g/m^3$ | 0.33 $\mu g/m^3$ |
| Carbon monoxide | 1-hour | 2,000 $\mu g/m^3$ | 29.7 $\mu g/m^3$ |
| Carbon monoxide | 8-hour | 500 $\mu g/m^3$ | 16.7 $\mu g/m^3$ |
| Particulate matter | 24-hour | 5.0 $\mu g/m^3$ | 3.0 $\mu g/m^3$ |
| Particulate matter | Annual | 1.0 $\mu g/m^3$ | 0.20 $\mu g/m^3$ |

Based on these results, the pollutant levels at the US/Mexico border would still be well below U.S. EPA's SL thresholds. The nitrogen dioxide concentration in the U.S. from the four turbines will be 0.33 $\mu g/m^3$; the SL for nitrogen dioxide is 1.0 $\mu g/m^3$. The one-hour increase in carbon monoxide concentration levels in the U.S. will be 29.7 $\mu g/m^3$; the SL is 2,000 $\mu g/m^3$. For particulate matter, the 24-hour increase will be 2.58 $\mu g/m^3$; the SL is 5.0 $\mu g/m^3$. The annual average increase of particulate matter will be 0.41 $\mu g/m^3$ compared to a SL of 1.0 $\mu g/m^3$. Thus, none of the increased concentration levels will exceed the U.S. EPA's SLs.

# APPENDIX C

# Biological Technical Report and Wetland Delineation Report

# Biological Technical Report
# for the
# Imperial Valley to La Rosita 230-kV Line
# Imperial County, California

# BIOLOGICAL TECHNICAL REPORT FOR THE IMPERIAL VALLEY TO LA ROSITA 230-KV LINE IMPERIAL COUNTY, CALIFORNIA

Prepared for

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# Summary of Findings

Sempra Energy Resources (SER) and Baja California Power, Inc. (BCP) propose constructing new double-circuit 230-kilovolt (kV) transmission lines extending about six miles south from the Imperial Valley Substation owned and operated by San Diego Gas and Electric Company (SDG&E), to the United States (U.S.)-Mexico international border. The project is located in the Yuha Basin of the Colorado Desert in Imperial County, California, southwest of the town of El Centro. The area surveyed consists of a 2,150-foot-wide corridor from the Imperial Valley Substation to the Mexican border.

Two vegetation communities were identified within the survey area: Sonoran creosote bush scrub and desert wash. Neither of these vegetation communities are considered sensitive. No sensitive plant species were observed within the survey corridor during the surveys conducted by RECON. One sensitive plant, brown turbans, and two noteworthy plants, Wiggin's cholla, and Thurber's pilostyles, have been previously identified within the survey corridor. Three sensitive animal species were observed within the corridor: flat-tailed horned lizard, western burrowing owl, and prairie falcon.

Project impacts were analyzed based on a set of assumptions made using the current project design. Project revisions, if substantial, may require a re-analysis of these impacts.

The proposed design will permanently impact approximately 3.10 acres of Sonoran creosote bush scrub and 0.28 acre of desert wash. Temporary impacts will be approximately 14.96 acres of Sonoran creosote bush scrub and 0.46 acre of desert wash. The temporary impact calculations for the Sonoran creosote bush scrub includes the maximum work area for the northern portion of the project and includes overlap between the pull sites and the projected work area at each tower location and thus represents a conservative estimate of impact acreage. Construction methods (i.e., water spray for dust control) could encourage the invasion of non-native, invasive species into these vegetation communities. The project may also impact the flat-tailed horned lizard and burrowing owl. A series of measures will be required to avoid, minimize, or mitigate direct impacts to individuals of these species. Measures will include the presence of a biological monitor and pre-construction clearance surveys. If active burrowing owl burrows are located, an additional mitigation program will need to be implemented to prevent direct loss of individuals and occupied burrows.

The proposed project is expected to impact a total of 0.21 acre of U.S. Army Corps of Engineers (USACE) non-wetland jurisdictional waters of the U.S., which includes both temporary and permanent impacts. There will be no impacts to wetlands. These impacts should be mitigated at a ratio consistent with federal regulatory agencies, which is typically 1:1. Temporary impacts of 0.13 acre will be mitigated by returning the area to the pre-construction contour and vegetative condition. It is recommended that permanent

impacts of 0.08 acre be mitigated through the enhancement of the survey corridor through removal of the non-native, invasive tamarisk located along the eastern edge of the Imperial Valley Substation. A restoration plan will be prepared detailing the proposed mitigation for impacts to jurisdictional waters.

Impacts to these waters will require a Section 404 permit from the USACE and a 401 certificate from the Regional Water Quality Control Board in accordance with the Clean Water Act. This project would be covered by Nationwide Permit (NWP) #12 which regulates all activities required for the construction of utility lines and associated facilities within waters of the U.S.

# Introduction

The project is located in the Yuha Basin of the Colorado Desert in Imperial County, California, southwest of the town of El Centro (Figure 1). Sempra Energy Resources (SER) and Baja California Power, Inc. (BCP) propose constructing new double-circuit 230-kV transmission lines extending about six miles south from the Imperial Valley Substation owned and operated by SDG&E, to the U.S.-Mexico international border (Figure 2). The proposed project consists of the following components:

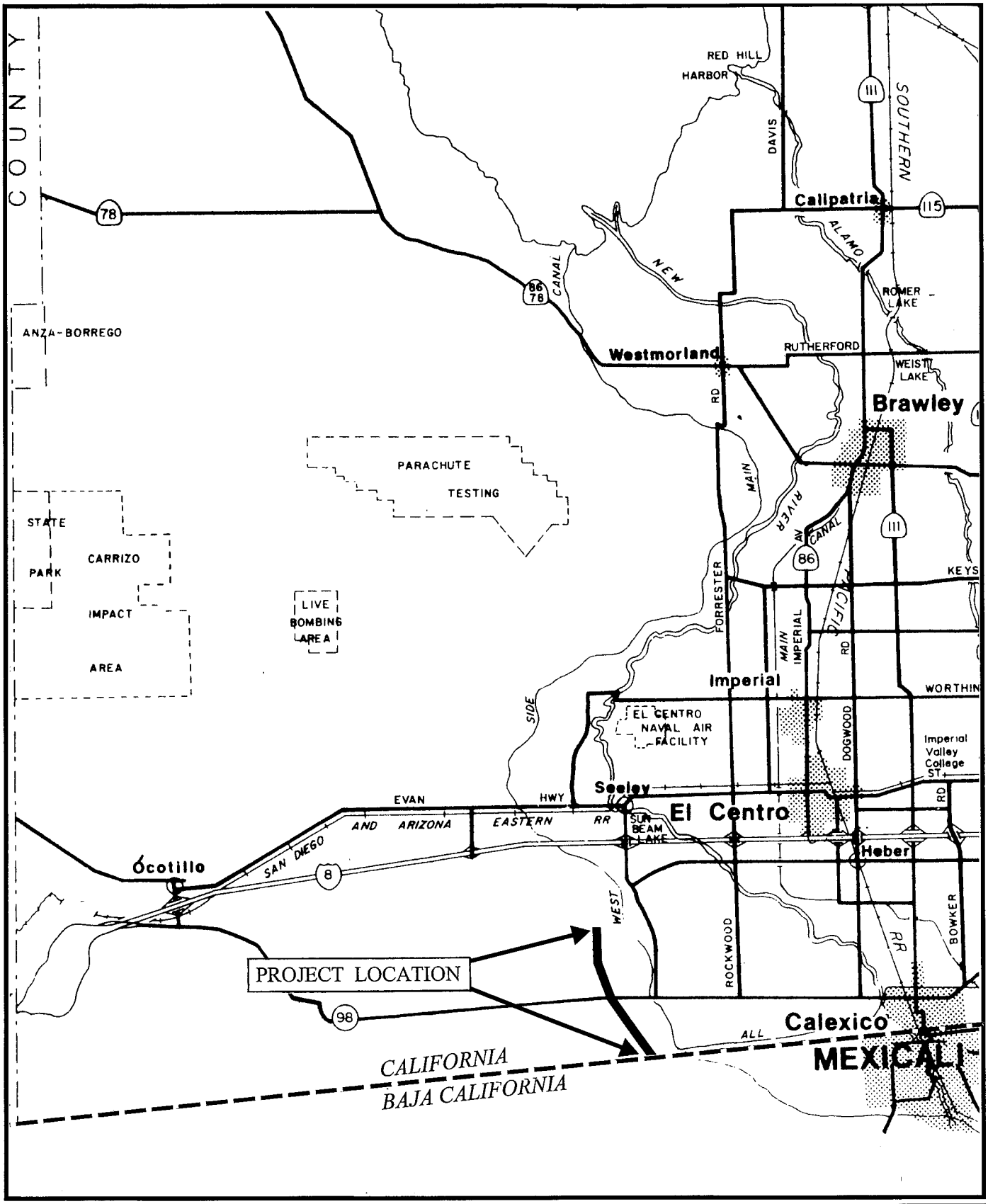
- The construction, operation, and maintenance of a 230-kV, double-circuit transmission line between the U.S./Mexico international border and the SDG&E Imperial Valley Substation by SER.

- The construction, operation, and maintenance of a 230-kV, double-circuit transmission line between the U.S./Mexico international border and the SDG&E Imperial Valley Substation by BCP.

- Relocation of a portion of the existing 230-kV, single-circuit transmission line owned and operated by SDG&E near the Imperial Valley Substation.

- Relocation of approximately two poles of an existing 230-kV, single-circuit transmission line owned and operated by the Imperial Irrigation District (IID) near the Imperial Valley Substation.

The objective of the complete project is to connect electrical generating plants being constructed in Mexico with the electrical power grid operated by SDG&E in southern California for the purpose of importing electrical power into the United States. The project corridor is located completely on Bureau of Land Management (BLM) property and is bisected by Highway 98.



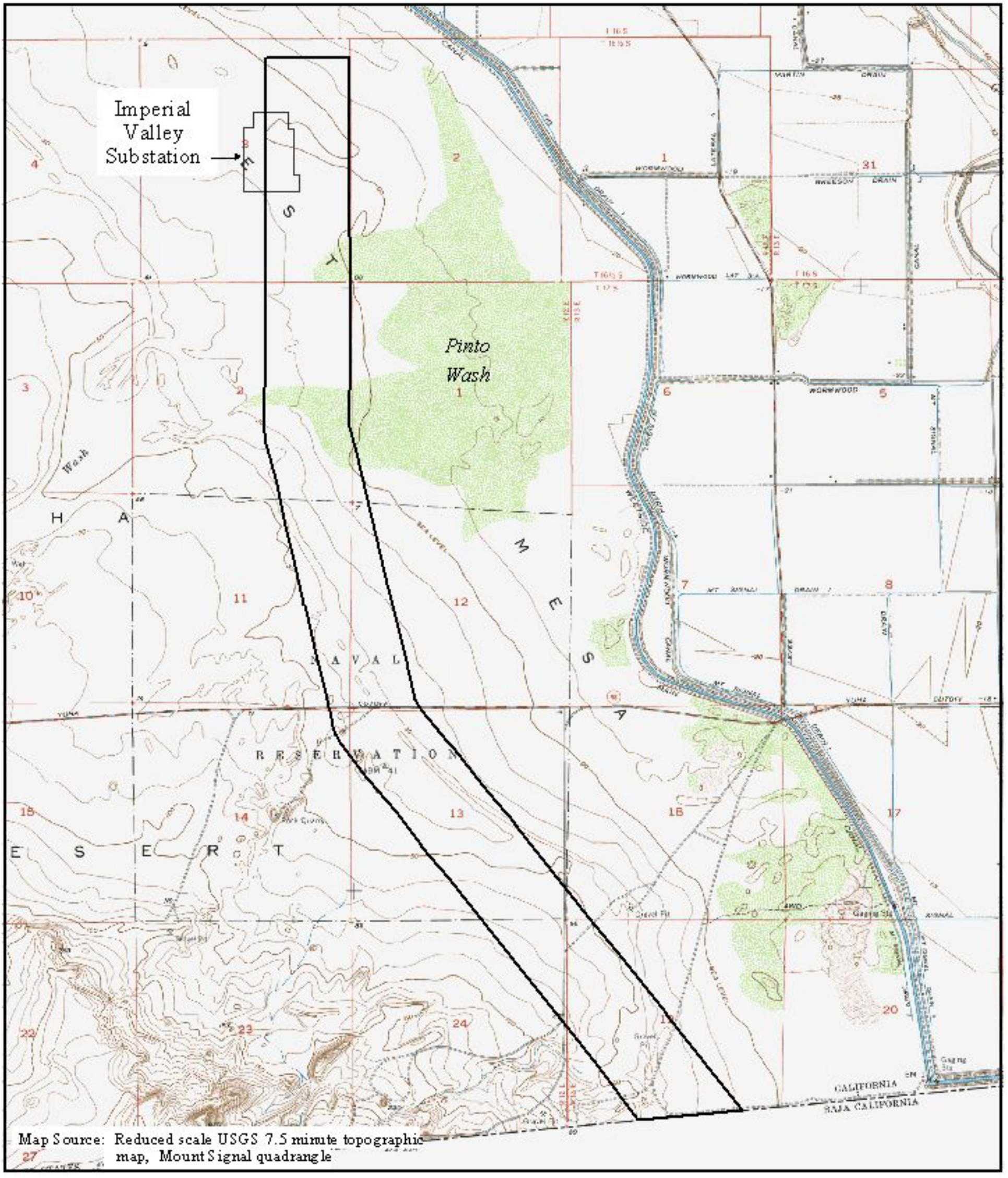

Source: California Dept. of Transportation

0 MILES 5.2 10.4

R-3366B

# FIGURE 1

**Location of the Project in Western Imperial County**




Map Source: Reduced scale USGS 7.5 minute topographic map, Mount Signal quadrangle

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# FIGURE 2

## Project Vicinity

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A general biological survey was conducted to map vegetation communities and to assess the presence or potential for presence of sensitive floral and faunal species apparent at the time of the surveys.

# Survey Methods

A general biological resources survey was conducted on September 27, October 24 and 25, and December 12, 2000, by RECON biologists Wendy Loeffler, Cynthia Jones, Jennifer Hodge, and Cheri Boucher. Vegetation communities were assessed and mapped on a color aerial flown in 2000. The area surveyed consists of a 2,150-foot-wide corridor. This includes a 120-foot-wide easement for the existing 230-kV power line and an additional 1,015 feet on each side. Animal species observed directly or detected from calls, tracks, scat, nests, or other sign were noted. All plant species observed on-site were also noted, and plants that could not be identified in the field were identified later using taxonomic keys.

On October 24 and 25, 2000, a wetland delineation was performed by RECON biologists Gerry Scheid and Jennifer Hodge according to the guidelines set forth by the USACE (1987) with a follow-up visit made on December 12, 2000. A wetland delineation is used to identify and map the extent of the wetlands and "waters of the U.S." within the proposed project boundary and provide information regarding both state and federal jurisdictional issues. The results of this delineation are provided under separate cover in Wetland Delineation Report for the Imperial Valley to La Rosita 230-Kv Line Imperial County, California, dated July 24, 2001, and are incorporated here, as appropriate.

A habitat assessment and preliminary survey was conducted for the flat-tailed horned lizard (*Phrynosoma mcallii*) by Mark Dodero and other RECON biologists on September 27, 2000 to verify the suitability of the site to support the species and to determine whether the species could be detected this season.

Limitations to the compilation of a comprehensive floral checklist were imposed by seasonal factors, such as blooming period and emergence of spring annual species. Faunal species that are only present during the breeding season of late spring to summer, such as breeding birds and butterflies, were not detected. Since surveys were performed during the day, nocturnal animals were detected by sign.

Floral nomenclature for plants follows Hickman (1993). Plant community classifications generally follows Holland (1986). Zoological nomenclature for birds is in accordance with the American Ornithologists' Union Checklist (1998); for mammals, Jones et al. (1982); and for amphibians and reptiles, Collins (1997). Assessments of the sensitivity of species and habitats are based primarily on Skinner and Pavlik (1994), State of California (2000a and 2000b), and Holland (1986).

Several previous surveys have been conducted on the project site or in the general vicinity. Results have been presented in the Final Environmental Impact Statement and Proposed Plan for the California Desert Conservation Area (BLM 1980) and Final Environmental Impact Report for the San Diego Gas & Electric Company's Imperial Valley to La Rosita 230-kV Transmission Line (Environmental Science Associates, Inc. 1983). Information regarding sensitive species in these reports has been incorporated into this report, as appropriate.

# Existing Conditions

## A. Topography and Soils

Elevation of the survey area ranges from approximately sea level to 85 feet above mean sea level (U.S. Geological Survey 1957). The survey corridor is bisected by Highway 98. Pinto Wash is located to the north of the highway. An unnamed seasonal drainage is located to the south near the U.S./Mexico border. The site is relatively flat and homogenous.

Nine soil types are present within the survey corridor: Rositas sand, Rositas fine sand, Carsitas gravelly sand, Glenbar complex, Indio-Vint complex, Meloland fine sand, Niland fine sand, pits, and Rositas-Superstition loamy fine sand (U.S. Department of Agriculture 1978). The USDA soil survey (1978) did not cover a portion of the survey corridor south of Highway 98 and west of the existing 230-kV power line. Soils information from this area is not currently available.

**Rositas sand** (0-2 percent slopes) and **Rositas fine sand** (0-2 percent slopes) are alluvial or eolian sands found on floodplains, basins, and terraces. These are the dominant soil types found within the survey corridor and are primarily located north of Highway 98.

**Carsitas gravelly sand** (0-5 percent slopes) consists of alluvial materials weathered from granitic and metamorphic rocks. This soil type is the dominant soil type south of Highway 98.

**Glenbar complex** soils are alluvial soils of mixed origin. This soil complex is located in a small area just south of Highway 98.

**Indio-Vint complex** are level soils found on floodplains and alluvial basin floors. Soil types of this complex were formed in alluvial and eolian sediments of mixed origin. This soil complex is located in two places just north and south of Highway 98.

**Meloland fine sand** is also found on floodplains and alluvial basin floors and is formed from alluvial and eolian sediments. This soil type is found in one small area just south of Highway 98.

**Niland fine sand** consists of fine brown sand with a subsoil of brown silty clay and is a soil found on level floodplains and alluvial basin floors. This soil type is located in a small area to the north of Highway 98.

**Rositas-Superstition loamy fine sand** is a complex of several soil types formed in terrace sediment of West Mesa. The soil types within the complex are derived from alluvial or eolian sand material. Only one small area of this soil complex is present north of Highway 98.

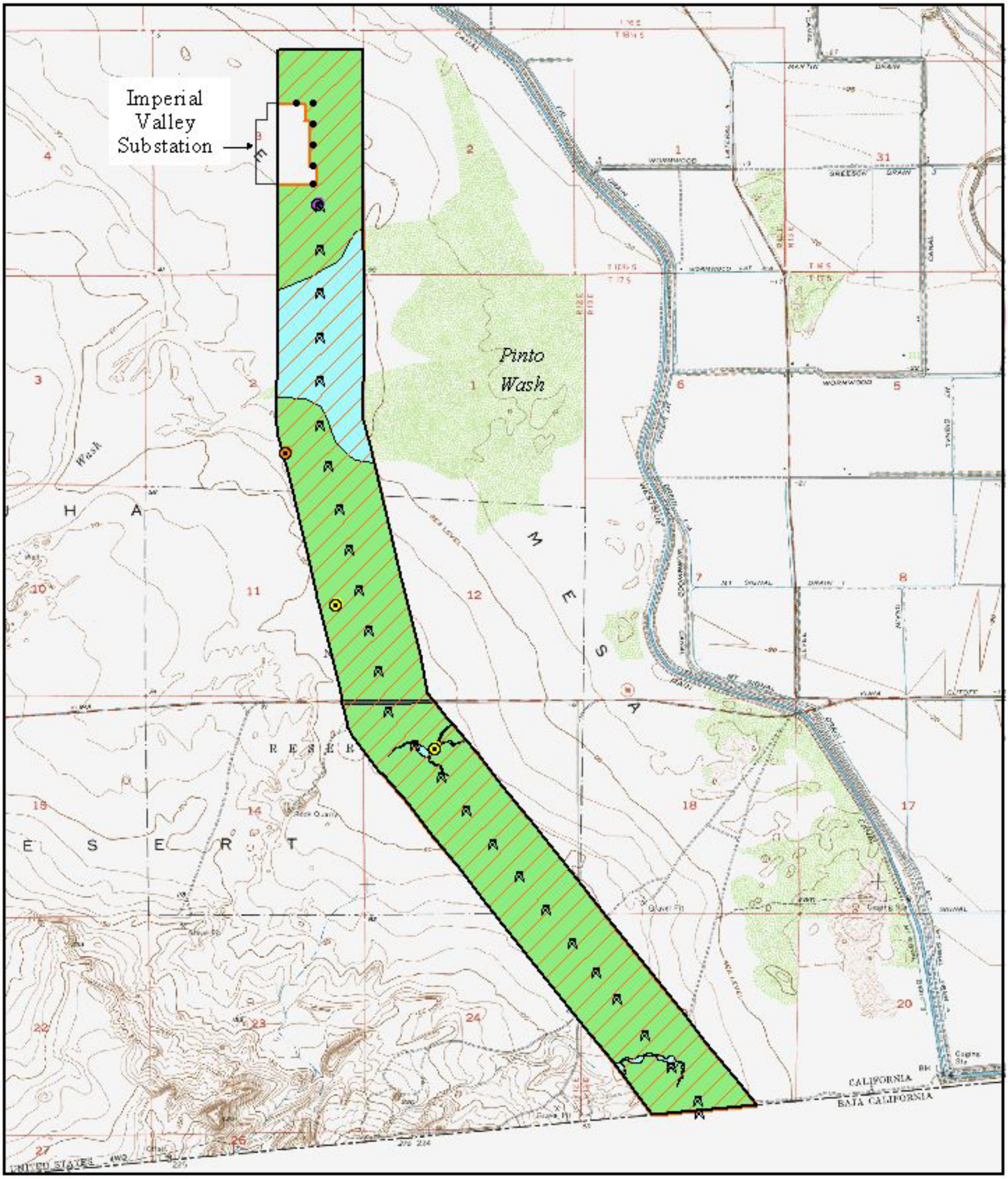
**Pits** is a mapping unit that describes areas where soil has been removed, generally through gravel mining. Two pits areas are identified near the southern boundary of the survey corridor.

# B. Botany

Two vegetation communities were identified within the survey area: Sonoran creosote bush scrub and desert wash. Table 1 presents the acreages of each community within the survey corridor. There are a total of 1,463.7 acres within the survey corridor. Figure 3 illustrates the locations of the vegetation communities. A total of 34 plant species were identified on the site (Attachment 1). Of this total, 31 (91 percent) are species native to southern California and 3 (9 percent) are introduced species.

**TABLE 1**
**VEGETATION COMMUNITIES**
**WITHIN THE SURVEY CORRIDOR**

| Resource | Acres |
|---|---|
| Sonoran creosote bush scrub | 1,217.7 |
| Desert wash | 203.6 |
| Developed | 42.4 |
| TOTAL | 1,463.7 |

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# FIGURE 3

## Existing Biological Resources

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### 1. Sonoran Creosote Bush Scrub (1,217.7 acres)

Sonoran creosote bush scrub is the dominant vegetation community and accounts for approximately 1,217.7 acres within the survey corridor both north and south of Highway 98. The vegetation is open and relatively sparse, dominated by creosote bush (*Larrea tridentata*). Burro-weed (*Ambrosia dumosa*) and two species of saltbush (*Atriplex* spp.) were also common. Several trees, such as ironwood (*Olneya tesota*), velvet mesquite (*Prosopis velutina*), and catclaw acacia (A*cacia greggii*), are interspersed throughout the community, particularly in the southern half. A few scattered tamarisk (*Tamarix* sp.) are present in patches on the southern portion of the survey corridor and a large patch of tamarisk is located along the eastern boundary of the Imperial Valley Substation.

### 2. Desert Wash (203.6 acres)

Desert wash is found in three distinct areas within the survey corridor for a total of 203.6 acres. The largest area is located near the northern boundary of the corridor and is a part of Pinto Wash, which extends from just east of the survey corridor southwest into Mexico. The dominant species in the wash is smoke tree (*Psorothamnus spinosus*) occurring with velvet mesquite, cat claw acacia, encelia (*Encelia frutescens*), verbena (*Abronia villosa* var. *villosa*), and big galleta (*Pleuraphis rigida*). The second of the three areas is located just south of Highway 98. This area includes the confluence of two streams, where a culvert and dam have been placed. The area directly downstream of the culvert has been heavily disturbed due to off-road vehicle traffic. The road crosses the drainage at this location. Little to no vegetation is found in this disturbed area or east of the culvert. The two finger drainages west of the culvert support verbena, chinchweed (*Pectis papposa*), paper flower (*Psilostrophe cooperi*), and white dalea (*Psorothamnus emoryi*). The southernmost area is an extension of an unnamed intermittent drainage that flows north from Signal Mountain just over the U.S.-Mexico border and then to the east into the survey corridor, where the drainage terminates. The western edge of this area contains a uniform stand of tamarisk while the remainder is primarily unvegetated with a few scattered shrubs. One large ironwood tree occurs in this section of the drainage.

### 3. Developed (42.4 acres)

Highway 98 bisects the survey corridor in an east-west direction and accounts for 5.5 acres of the survey corridor. A portion of the survey corridor has been developed as the Imperial Valley Substation and is located in the upper northwest portion of the corridor. This covers 36.9 acres of the survey area.

## C. Zoology

Overall, the project area and vicinity provides high value habitat for wildlife species. The site contains high-quality Sonoran creosote bush scrub and desert wash habitats, which

provide cover, foraging, and breeding habitat for a variety of native wildlife species. A complete list of the wildlife species detected is provided in Attachment 2. Sensitive species potentially occurring on-site are discussed in the Sensitive Biological Resources section.

## 1. Amphibians

Most amphibians require moisture for at least a portion of their life cycle, with many requiring a permanent water source for habitat and reproduction. Terrestrial amphibians have adapted to more arid conditions and are not completely dependent on a perennial or standing source of water. These species avoid desiccation by burrowing beneath the soil or leaf litter during the day and during the dry season.

No amphibians were detected during the surveys.

## 2. Reptiles

The diversity and abundance of reptile species varies with habitat type. Many reptiles are restricted to certain vegetation communities and soil types although some of these species will also forage in adjacent communities. Other species are more ubiquitous using a variety of vegetation types for foraging and shelter.
Both the desert iguana (*Dipsosaurus dorsalis*) and flat-tailed horned lizard were observed within the survey corridor. The flat-tailed horned lizard is known to inhabit this entire region (State of California 2000c; BLM, unpublished data). Other common species known from this region and expected to occur within the survey corridor are long-tailed brush lizard (*Urosaurus graciosus*), side-blotched lizard (*Uta stansburiana*), long-nose leopard lizard (*Gambelia wislizenii*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus draconoides*), coachwhip (*Masticophis flagellum*), sidewinder (*Crotalus cerastes*), western patch-nosed snake (*Salvadora hexalepis*), western shovel-nosed snake (*Chionactis occipitalis*), and spotted leaf-nosed snake (*Phyllorhynchus decurtatus*) (G. Wright, pers. comm. 2001).

## 3. Birds

The diversity of bird species varies with respect to the character, quality, and diversity of vegetation communities. Due to the homogeneity of habitats present within the survey corridor, the bird diversity is fairly low.

Birds commonly observed include yellow-rumped warbler (*Dendroica coronata*) and white-crowned sparrow (*Zonotricha leucophrys*). Two wintering species, blue-gray gnatcatcher (*Polioptila caerulea*) and rock wren (*Salpinctes obsoletus obsoletus*), potentially breed in the study area.

Raptors observed include red-tailed hawk (*Buteo jamaicensis*) and prairie falcon (*Falco mexicanus*). The prairie falcon was perched on one of the existing towers. A western burrowing owl (*Speotyto cunicularia hypugaea*) was observed within one of the small desert washes south of Highway 98.

### 4. Mammals

Sonoran creosote bush scrub and desert wash communities typically provide cover and foraging opportunities for a variety of mammal species. Many mammal species are nocturnal and must be detected during daytime surveys by observing their sign, such as tracks, scat, and burrows.

Desert black-tailed jackrabbit (*Lepus californicus deserticola*), cottontail rabbit (*Sylvilagus audubonii*), round-tailed ground squirrel (*Spermophilus tereticaudus tereticaudus*), coyote (*Canis latrans*), and desert kit fox (*Vulpes macrotis*) were identified within the survey corridor. Other common species known from this region and expected to occur within the survey corridor are badger (*Taxidea taxus*), bobcat (*Lynx rufus*), and raccoon (*Procyon lotor*). Mule deer (*Odocoileus hemionus*) and mountain lion (*Felis concolor*) are occasionally observed within this region as well (G. Wright, pers. comm. 2001).

## D. Sensitive Biological Resources

Federal and state agencies regulate sensitive species and require an assessment of the presence or potential presence of sensitive species to be conducted on-site prior to the approval of any proposed development on a property. For purposes of this report, species will be considered sensitive if they are: (1) listed or proposed for listing by state or federal agencies as threatened or endangered; (2) on List 1B (considered endangered throughout its range) or List 2 (considered endangered in California but more common elsewhere) of the California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1994); or (3) sensitive, rare, endangered, or threatened by other local conservation organizations or specialists.

Noteworthy plant species are considered to be those which are on List 3 (more information about the plant's distribution and rarity needed) and List 4 (plants of limited distribution) of the CNPS *Inventory*.

Determination of the potential occurrence for listed, sensitive, or noteworthy species are based upon known ranges and habitat preferences for the species (Zeiner et al. 1988a, 1988b, 1990; Skinner and Pavlik 1994; Reiser 1994); species occurrence records from the NDDB (State of California 2000c); and species occurrence records from other sites in the vicinity of the project site.

## 1. Sensitive Plant Communities

Neither Sonoran creosote bush scrub or desert wash are considered sensitive.

## 2. Sensitive Plants

One sensitive plant, brown turbans (*Malpernia tenuis*), and two noteworthy plants, Wiggin's cholla (*Opuntia wigginsii*) and Thurber's pilostyles (*Pilostyles thurberi*), have been previously identified within the corridor. These are discussed in more detail below.

### a. Observed

**Brown turbans (*Malpernia tenuis*).** Brown turbans, a CNPS List 2 species, is an annual herbaceous species known from southern California in sandy, desert scrub habitats. This species was reported in the Yuha Desert south of Pinto Wash (Reiser 1994; State of California 2000c). This is a very general location description and it is not certain that the species was observed within the survey corridor itself. However, the habitat within the survey corridor is suitable for the species and it has a high potential to occur.

**Wiggin's cholla (*Opuntia wigginsii*).** Wiggin's cholla, a CNPS List 3 species, is a cactus found primarily in Sonoran Desert scrub habitats. This species is considered by some authorities to be a sporadic hybrid between two other cactus species: pencil cactus (*Opuntia ramosissima*) and silver cholla (*O. echinocarpa*). This species was reported to be present within the existing transmission line corridor in 1983 (Environmental Science Associates, Inc. 1983). Conditions do not appear to have been altered significantly since the original observation and this species is expected to still be present within the survey corridor.

**Thurber's pilostyles (*Pilostyles thurberi*).** Thurber's pilostyles, a CNPS List 4 species, is a parasitic herbaceous species found primarily in the stems of white dalea (*Psorothamnus emoryi*). White dalea is a common plant of desert scrub and washes. Thurber's pilostyles was reported to be present within the existing transmission line corridor in 1983 (Environmental Science Associates, Inc. 1983). Conditions do not appear to have been altered significantly since the original observation and the host plant is common within Pinto Wash in the survey area. This species is expected to still be present within the survey corridor.

### b. Not Observed

Several other sensitive species are known to occur in the vicinity of the project area and are considered as potentially occurring based on vegetation communities present within the survey area. Table 2 summarizes the status and habitats for each of these potentially occurring species, with codes explained in Table 3.

**TABLE 2**
**SENSITIVE PLANT SPECIES**
**OBSERVED (†) OR WITH THE POTENTIAL FOR OCCURRENCE**

| Species | State/Federal Status | CNPS List | CNPS Code | Comments |
|---|---|---|---|---|
| *Amaranthus watsonii* Watson's amaranth | –/– | 4 | 1-1-1 | Mojavean desert scrub; Sonoran desert scrub. Suitable habitat present; high potential to occur. |
| *Astragalus crotalariae* Salton milk vetch | –/– | 4 | 1-1-2 | Sonoran desert scrub/ sandy or gravelly. Suitable habitat present, high potential to occur. |
| *Astragalus insularis* var. *harwoodii* Harwood's milk vetch | –/– | 2 | 2-2-1 | Desert dunes. No suitable habitat; not expected to occur. |
| *Astragalus lentiginosus* var. *borreganus* Borrego milk vetch | –/– | 4 | 1-1-1 | Mojavean desert scrub, Sonoran desert scrub/sandy. Suitable habitat present; high potential to occur. |
| *Astragalus magdalenae* var. *peirsonii* Peirson's milk-vetch | CE/FT | 1B | 2-2-2 | Desert dunes. No suitable habitat present, not expected to occur. |
| *Bursera microphylla* Elephant tree | –/– | 2 | 3-1-1 | Sonoran desert scrub/rocky. No suitable soils, not observed during surveys. Not expected to occur. |
| *Calliandra eriophylla* Fairyduster | –/– | 2 | 2-1-1 | Sonoran desert scrub/sandy. Suitable habitat present; high potential to occur. |
| *Camissonia arenaria* Sand evening-primrose | –/– | 4 | 1-1-1 | Mojavean desert scrub, Sonoran desert scrub/sandy, rocky. Suitable habitat present; high potential to occur. |
| *Cassia covesii* Cove's cassia | –/– | 2 | 2-2-1 | Sonoran desert scrub/sandy. Suitable habitat present; high potential to occur. |
| *Castela emoryi* Crucifixion thorn | –/– | 2 | 2-1-1 | Mojavean and Sonoran desert scrub. Very localized to the west of the study area. Not observed and not expected to occur. |
| *Cereus giganteus* Saguaro | –/– | 2 | 3-2-1 | Sonoran desert scrub/rocky. Soils not rocky; not observed in study area. |
| *Chamaesyce abramsiana* Abram's spurge | –/– | 2 | 3-2-1 | Mojavean desert scrub, Sonoran desert scrub/sandy. Suitable habitat present; high potential to occur. |

**TABLE 2**
**SENSITIVE PLANT SPECIES**
**OBSERVED (†) OR WITH THE POTENTIAL FOR OCCURRENCE**
**(continued)**

| Species | State/Federal Status | CNPS List | CNPS Code | Comments |
|---|---|---|---|---|
| *Chamaesyce platysperma* Flat-seeded spurge | –/– | 3 | 3-2-2 | Desert dunes, Sonoran desert scrub/sandy. Possibly endemic to California. Suitable habitat present; high potential to occur. |
| *Condalia globosa* var. *pubescens* Spiny abrojo | –/– | 4 | 1-2-1 | Sonoran desert scrub. Suitable habitat present but not observed on-site. Low potential to occur. |
| *Coryphanta vivipara* var. *alversonii* Alverson's foxtail cactus | –/– | 1B | 3-2-2 | Mojavean desert scrub, Sonoran desert scrub. Threatened by horticultural collecting. Suitable habitat present but not observed on-site. Low potential to occur. |
| *Croton wigginsii* Wiggin's croton | CR/– | 2 | 2-2-1 | Desert dunes, Sonoran desert scrub. Moderately suitable habitat present; moderate potential to occur. |
| *Cryptantha costata* Ribbed cryptantha | –/– | 4 | 1-1-2 | Mojavean and Sonoran desert scrub/sandy. Suitable habitat present; high potential to occur. |
| *Cryptantha holoptera* Winged cryptantha | –/– | 4 | 1-1-2 | Mojavean and Sonoran desert scrub. Suitable habitat present; high potential to occur. |
| *Cynanchum utahense* Utah cynanchum | –/– | 4 | 1-1-1 | Mojavean and Sonoran desert scrub/ sandy, gravelly. Suitable habitat present; high potential to occur. |
| *Ditaxis adenophora* Glandular ditaxis | –/– | 2 | 3-2-1 | Mojavean and Sonoran desert scrub/sandy. Suitable habitat present; high potential to occur. |
| *Eucnide rupestris* Rock nettle | –/– | 2 | 3-2-1 | Sonoran desert scrub. Known from approximately 3 miles east of study area. Suitable habitat present; high potential to occur. |
| *Helianthus niveus* ssp. *tephrodes* Algodones Dunes sunflower | CE/– | 1B | 3-2-1 | Desert dunes. No suitable habitat present, not expected to occur. |

**TABLE 2**
**SENSITIVE PLANT SPECIES**
**OBSERVED (†) OR WITH THE POTENTIAL FOR OCCURRENCE**
**(continued)**

| Species | State/Federal Status | CNPS List | CNPS Code | Comments |
|---|---|---|---|---|
| *Ipomopsis effusa*<br>Baja California ipomopsis | –/– | 2 | 3-3-1 | Known from Pinto Wash west of study area. High potential to occur. |
| *Lupinus excubitus* var. *medius*<br>Mountain Springs bush lupine | –/– | 1B | 2-1-2 | Pinyon-juniper woodland, Sonoran desert scrub. Generally occurs in elevations above 1,000 feet. Maximum elevation within survey area is 85 feet. Not expected to occur based on elevation restrictions. |
| *Lycium parishii*<br>Parish's desert-thorn | –/– | 2 | 2-1-1 | Coastal sage scrub, Sonoran desert scrub. Suitable habitat present. Not observed during survey; low potential to occur. |
| *Malperia tenuis*†<br>Brown turbans | –/– | 2 | 3-1-1 | Sonoran desert scrub/sandy. Historically observed from the study area. High potential to occur. |
| *Nemacaulis denudata* var. *gracilis*<br>Slender woolly-heads | –/– | 2 | 2-2-1 | Sandy soils. High potential to occur. |
| *Opuntia munzii*<br>Munz's cholla | –/– | 3 | 3-1-3 | Sonoran desert scrub/sandy, gravelly. Suitable habitat present in study area but species only known from Chocolate Mountains. Not expected to occur. |
| *Opuntia wigginsii*†<br>Wiggins' cholla | –/– | 3 | 3-1-2 | Sonoran desert scrub/ sandy. Previously observed within survey corridor. |
| *Pholisma sonorae*<br>Sand food | –/– | 1B | 2-2-2 | Desert dunes. No suitable habitat present, not expected to occur. |
| *Pilostyles thurberi*†<br>Thurber's pilostyles | –/– | 4 | 1-1-1 | Sonoran desert scrub. Parasitic on *Psorothamnus* spp. Host plant present; plant observed within survey corridor. |
| *Proboscidia althaeifolia*<br>Desert unicorn plant | –/– | 4 | 1-1-1 | Sonoran desert scrub. Suitable habitat present; high potential to occur. |

NOTE: See Table 3 for explanation of sensitivity codes.

**TABLE 3**
**SENSITIVITY CODES**

## FEDERAL CANDIDATES AND LISTED PLANTS

FE = Federally listed, endangered
FT = Federally listed, threatened
FPE = Federally proposed endangered
FPT = Federally proposed threatened

## STATE LISTED PLANTS

CE = State listed, endangered
CR = State listed, rare
CT = State listed, threatened

## CALIFORNIA NATIVE PLANT SOCIETY

### LISTS

1A = Species presumed extinct.

1B = Species rare, threatened, or endangered in California and elsewhere. These species are eligible for state listing.

2 = Species rare, threatened, or endangered in California but which are more common elsewhere. These species are eligible for state listing.

3 = Species for which more information is needed. Distribution, endangerment, and/or taxonomic information is needed.

4 = A watch list of species of limited distribution. These species need to be monitored for changes in the status of their populations.

### R-E-D CODES

**R (Rarity)**

1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time.

2 = Occurrence confined to several populations or to one extended population.

3 = Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.

**E (Endangerment)**

1 = Not endangered
2 = Endangered in a portion of its range
3 = Endangered throughout its range

**D (Distribution)**

1 = More or less widespread outside California
2 = Rare outside California
3 = Endemic to California

## 3. Sensitive Wildlife

Three sensitive species were observed within the corridor: flat-tailed horned lizard, western burrowing owl, and prairie falcon. These species are mapped on Figure 3.

### a. Observed

**Flat-tailed horned lizard (*Phrynosoma mcallii*).** The flat-tailed horned lizard is a BLM sensitive species and a California Department of Fish and Game (CDFG) species of special concern (State of California 2000b). Pursuant to a recent court order, this species may come under consideration for listing as threatened or endangered by the U.S. Fish and Wildlife Service (G. Wright, pers. comm. 2001).

The distribution of the flat-tailed horned lizard ranges from the Coachella Valley to the head of the Gulf of California and southwestern Arizona. The species typically occurs in areas with fine, sandy soils and sparse desert vegetation. It is also found in areas consisting of mudhills and gravelly flats. The species has declined because of habitat destruction for agriculture and development.

This species was observed during the current surveys and has been observed within the survey corridor during directed surveys conducted by BLM since 1979 (G. Wright, pers. com. 2000). In addition, the survey corridor is located within an identified management area, the Yuha Desert Management Area, for the flat-tailed horned lizard (Foreman 1997). Figure 3 shows the boundary of the areas where flat-tailed horned lizards have been observed during the BLM surveys. Given the homogeneity of the habitat and the fact that the survey corridor is located within a management area, the entire survey corridor is considered to support the species.

**Western burrowing owl (*Speotyto cunicularia hypugaea*).** The western burrowing owl is a BLM sensitive species and a CDFG species of special concern (State of California 2000b). This subspecies is known to nest throughout most of California. It is a year-round resident and nests from March through August, with peak nesting activity during April and May. In Imperial County it can be found in desert scrub, grassland, and agricultural areas, where it digs its own or occupies existing burrows. Urbanization has greatly restricted the extent of suitable habitat for this species. Other contributions to the decline of this species include the poisoning of prey species and collisions with automobiles.

Burrowing owls are historically known to exist in the general vicinity of the project site (State of California 2000c). One burrowing owl was observed on the sandy bank above the desert wash located in the center of the survey corridor. There is a potential for this species to nest and winter within the survey corridor.

**Prairie falcon (*Falco mexicanus*).** The prairie falcon is a CDFG species of special concern (State of California 2000b). This falcon ranges from the southeastern deserts

northwest along the inner Coast Ranges and Sierra Nevada. It can be a permanent resident or migrant bird found from annual grasslands to alpine meadows, but is associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas. This species nests on cliff ledges and occasionally in rock crevices.

One prairie falcon was observed on one of the existing towers just south of the Imperial Valley Substation. The survey corridor contains suitable foraging habitat, however, there is no suitable nesting habitat for this species within the survey corridor and it is not expected to nest within the survey area.

### b. Not Observed

Several other sensitive animals are either known to occur in the vicinity or have a potential to be present within the survey corridor. Table 4 lists the sensitive species observed on-site and those that could potentially occur on-site based on the ranges and habitat requirements of these species and includes the likelihood of occurrence for these species.

## 4. Wildlife Movement Corridors

Wildlife movement corridors are defined as areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Natural features such as canyon drainages, ridgelines, or areas with vegetation cover provide corridors for wildlife travel. Wildlife movement corridors are important because they provide access to mates, food, and water; allow the dispersal of individuals away from high population density areas; and facilitate the exchange of genetic traits between populations (Beier and Loe 1992). Wildlife movement corridors are considered sensitive by resource and conservation agencies.

The survey corridor is surrounded by undeveloped BLM open space. Wildlife can travel throughout the immediate region unimpeded and thus the site is not considered a movement corridor.

# E. Jurisdictional Areas

The methods for delineating wetlands used for this report follows guidelines set forth by the USACE (1987). Three criteria must be fulfilled in order to consider an area a jurisdictional wetland: (1) the presence of hydrophytic vegetation; (2) the presence of hydric soils; and (3) the presence of wetland hydrology. Atypical wetland areas (disturbed wetlands) and problem area wetlands (e.g., seasonal wetlands) may lack one or more of the three criteria but could still be considered wetlands if background information on the previous condition of the area and field observations indicate that the missing wetland criteria were present before the disturbance and would occur at the site under normal

**TABLE 4**
**SENSITIVE WILDLIFE SPECIES KNOWN (OR POTENTIALLY OCCURRING)**

| Species | Status | Habitat | Occurrence/Comments |
|---|---|---|---|
| Amphibians (Nomenclature from Collins 1997) | | | |
| Desert slender salamander<br>*Batrachoseps aridus* | FE, SE | Limestone fractures in desert canyons. Only known population in Santa Rosa Mountains of Riverside County. | Out of known range for species; not expected to occur. |
| Couch's spadefoot<br>*Scaphiosus couchi* | CSC, BLM | Temporary desert rainpools that last at least 7 days with water temperatures greater than 15°C | Known only from the Colorado River area in California. Not expected to occur. |
| Reptiles (Nomenclature from Collins 1997) | | | |
| Desert tortoise<br>*Gopherus agassizii* | FT, ST | Mohave and Sonoran desert areas, especially areas of creosote bush scrub. | Out of known range for species; not expected to occur. |
| Barefoot gecko<br>*Coleonyx switaki* | ST | Rock outcrops on arid hillsides and canyons in desert scrub vegetation types. | No suitable habitat; not expected to occur. |
| Colorado desert fringe-toed lizard<br>*Uma notata* | CSC, BLM | Loose sand of desert dunes, flats, riverbanks, and washes. Prefers scant vegetation. | Suitable habitat present; high potential to occur. |
| Flat-tailed horned lizard<br>*Phrynosoma mcalli* | CSC, BLM | Dunes and sandy flats of low desert. | Known to occur within survey corridor. |

**TABLE 4**
**SENSITIVE WILDLIFE SPECIES KNOWN (OR POTENTIALLY OCCURRING)**
**(continued)**

| Species | Status | Habitat | Occurrence/Comments |
|---|---|---|---|
| Birds (Nomenclature from American Ornithologists' Union) | | | |
| Northern harrier (nesting)<br>*Circus cyaneus* | CSC | Coastal lowland, marshes, grassland, agricultural fields. Migrant and winter resident, rare summer resident. | Winter foraging habitat present; not expected to nest within survey corridor. |
| Harris' hawk (nesting)<br>*Parabuteo unicinctus* | CSC | River woods, mesquite, brush, cactus deserts. Casual vagrant. | Reintroduced to region in 1980s with a few nests identified in 1990s only in the lower Colorado River area. Low potential to nest within survey corridor. |
| Red-tailed hawk (nesting)<br>*Buteo jamaicensis* | * | Found in almost all habitats throughout California expect in areas of heavy snow. Common resident. | Observed foraging over site. Low potential to nest within survey corridor. |
| Swainson's hawk (nesting)<br>*Buteo swainsoni* | ST | Plains, range, open hills, sparse trees. Uncommon spring migrant. | Local breeding population now extirpated; not expected to occur. |
| Golden eagle (nesting and wintering)<br>*Aquila chrysaetos* | CSC, CFP, BEPA | Require vast foraging areas in grassland, broken chaparral, or sage scrub. Nest in cliffs and boulders. Uncommon resident. | Range maps exclude the Imperial Valley; low potential to occur. |
| Merlin<br>*Falco columbarius* | CSC | Rare winter visitor. Grasslands, agricultural fields, occasionally mud flats. | Seldom found in open deserts, low potential to occur within survey corridor. |
| Peregrine falcon<br>*Falco peregrinus anatum* | SE, CFP | Open coastal areas, mud flats. Rare inland. Rare fall and winter resident, casual in late spring and early summer. | Not known to nest in Imperial County. Not expected to occur. |

**TABLE 4**
**SENSITIVE WILDLIFE SPECIES KNOWN (OR POTENTIALLY OCCURRING)**
**(continued)**

| Species | Status | Habitat | Occurrence/Comments |
|---|---|---|---|
| Prairie falcon (nesting)<br>*Falco mexicanus* | CSC | Grassland, agricultural fields, desert scrub. Uncommon winter resident. Rare breeding resident; nests on cliff ledges or in rock crevices. | Observed within survey corridor during winter. No suitable nesting habitat within the survey corridor. Not expected to nest on-site. |
| Elf owl (breeding)<br>*Micrathene whitneyi* | SE | Desert trees. Very localized populations to the east of the Colorado River. | Out of range from known breeding location; not expected to nest within survey corridor. |
| Western burrowing owl (burrow sites)<br>*Speotyto cunicularia hypugaea* | CSC, BLM | Grassland, agricultural land, coastal dunes with rodent burrows. Declining resident. | Observed within survey corridor during winter. High potential to nest within survey corridor. |
| Long-eared owl (nesting)<br>*Asio otis* | CSC | Riparian woodland, oak woodland, tamarisk woodland. Rare resident and winter visitor. Localized breeding. | Riparian habitat required by species. Tamarisk scrub within survey corridor not sufficient to support owl population; not expected to occur. |
| Gila woodpecker<br>*Melanerpes uropygialis* | SE | Saguaro and willow-cottonwood desert. Date palms, tamarisk. Lower Colorado River and near Brawley. | No suitable desert riparian habitat present; not expected to occur within survey corridor. |
| Crissal thrasher<br>*Toxostoma dorsale* | CSC | Dense thickets of shrubs or low trees in desert riparian and desert wash habitats. | Suitable habitat present; high potential to occur. |
| Le Conte's thrasher<br>*Toxostoma lecontei* | CSC, BLM | Desert washes, creosote bush scrub. Uncommon resident. | Generally does not overlap with Crissal thrasher range; low potential to occur. |
| Loggerhead shrike<br>*Lanius ludovicianus* | CSC | Open foraging areas near scattered bushes and low trees. | Suitable habitat present; high potential to occur. |

**TABLE 4**
**SENSITIVE WILDLIFE SPECIES KNOWN (OR POTENTIALLY OCCURRING)**
**(continued)**

| Species | Status | Habitat | Occurrence/Comments |
|---|---|---|---|
| Mammals (Nomenclature from Jones et al. 1982) | | | |
| California leaf-nosed bat<br>*Macrotus californicus* | CSC, BLM | Low deserts. Caves, mines, buildings. Colonial. Migrational. Mostly near Colorado River in California. | Suitable foraging habitat; no suitable roosting locations. High potential to forage over site. |
| Pallid bat<br>*Antrozous pallidus* | CSC, BLM | Arid deserts and grasslands. Shallow caves, crevices, rock outcrops, buildings, tree cavities. Especially near water. | Colonial. Audible echolocation signal. Moderate potential to forage over site; no suitable roosting habitat present. |
| Spotted bat<br>*Euderma maculatum* | CSC, BLM | Wide variety of habitats. Caves, crevices, trees. | Audible echolocation signal. Prefers sites with adequate roosting sites. No suitable roosting site; not expected to occur. |
| Pale big-eared bat<br>*Corynorhinus townsendii pallescens* | CSC, BLM | Caves, mines, buildings. Found in a variety of habitats, arid and mesic. | Individual or colonial. Extremely sensitive to disturbance. No suitable roosting site; not expected to occur. |
| Pocketed free-tailed bat<br>*Nyctinomops femorosacca* | CSC | Normally roost in crevice in rocks, slopes, cliffs. Lower elevations in San Diego and Imperial Counties. | Colonial. Leave roosts well after dark. Moderate potential to forage over site; no suitable roosting habitat present. |
| Southern grasshopper mouse<br>*Onychomys torridus ramona* | CSC | Alkali desert scrub & desert scrub preferred. Also succulent shrub, wash, & riparian areas; coastal sage scrub, mixed chaparral, sagebrush, low sage, and bitterbrush. Low to moderate shrub cover preferred. | Suitable habitat present; high potential to occur. |

**TABLE 4**
**SENSITIVE WILDLIFE SPECIES KNOWN (OR POTENTIALLY OCCURRING)**
**(continued)**

| Species | Status | Habitat | Occurrence/Comments |
|---|---|---|---|
| San Diego desert woodrat<br>*Neotoma lepida intermedia* | CSC | Coastal sage scrub, chaparral, most desert habitats. | Suitable habitat present; high potential to occur. |
| American badger<br>*Taxidea taxus* | * | Grasslands, Sonoran desert scrub. | Suitable habitat present; high potential to occur. |

STATUS CODES

Listed/Proposed
FE = Listed as endangered by the federal government
FT = Listed as threatened by the federal government
SE = Listed as endangered by the state of California
ST = Listed as threatened by the state of California

Other
BEPA = Bald and Golden Eagle Protection Act
BLM = Bureau of Land Management
CFP = California fully protected species
CSC = California Department of Fish and Game species of special concern
* = Taxa listed with an asterisk fall into one or more of the following categories:
- Taxa considered endangered or rare under Section 15380(d) of CEQA guidelines
- Taxa whose nests are protected under State of California Fish and Game Code
- Taxa that are biologically rare, very restricted in distribution, or declining throughout their range
- Population(s) in California that may be peripheral to the major portion of a taxon's range, but which are threatened with extirpation within California
- Taxa closely associated with a habitat that is declining in California at an alarming rate (e.g., wetlands, riparian, old growth forests, desert aquatic systems, native grasslands)

circumstances. In addition, areas that displayed a prominent ordinary high water mark were also evaluated as potential non-wetland jurisdictional waters or disturbed wetland.

Waters of the U.S., as defined by USACE, were delineated on-site and are described below.

### USACE

Based on information on soils, hydrology, and vegetation, observations made in the field, and data analysis, one wetland and three areas of non-wetland jurisdictional waters of the U.S were delineated in the study area. The total area likely to be regulated by USACE within the survey corridor is approximately 38.7 acres, including a 0.90-acre wetland. These areas are depicted in Figure 4.

# Project Impacts

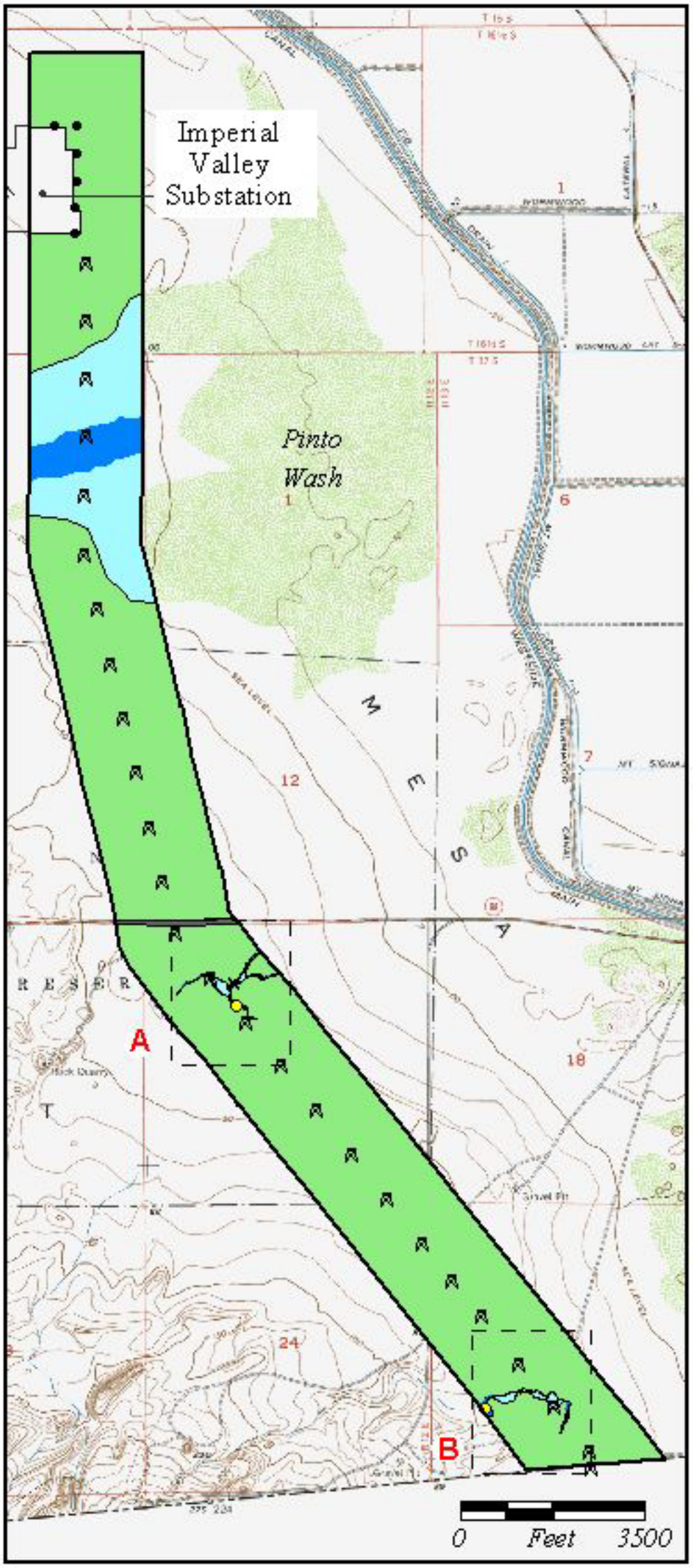
## A. Project Description

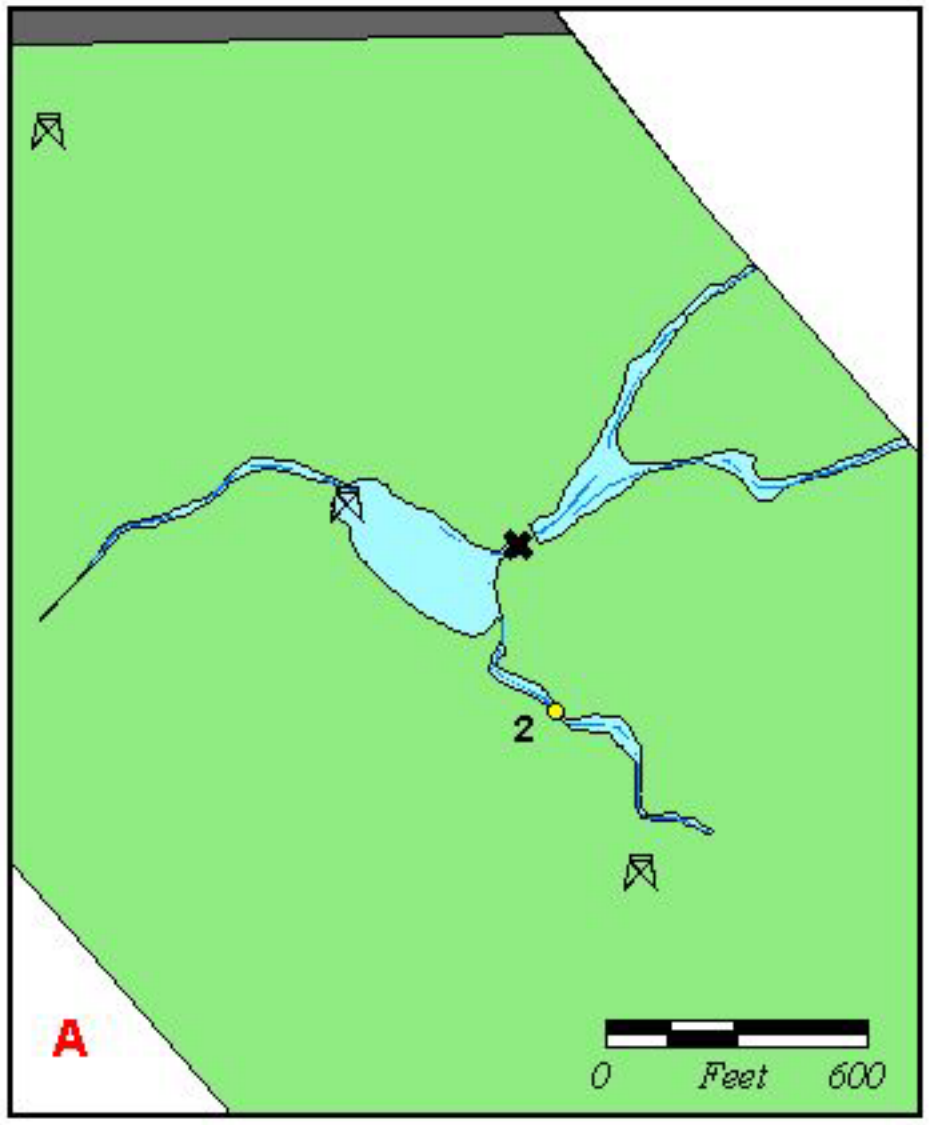
### 1. General Project Description

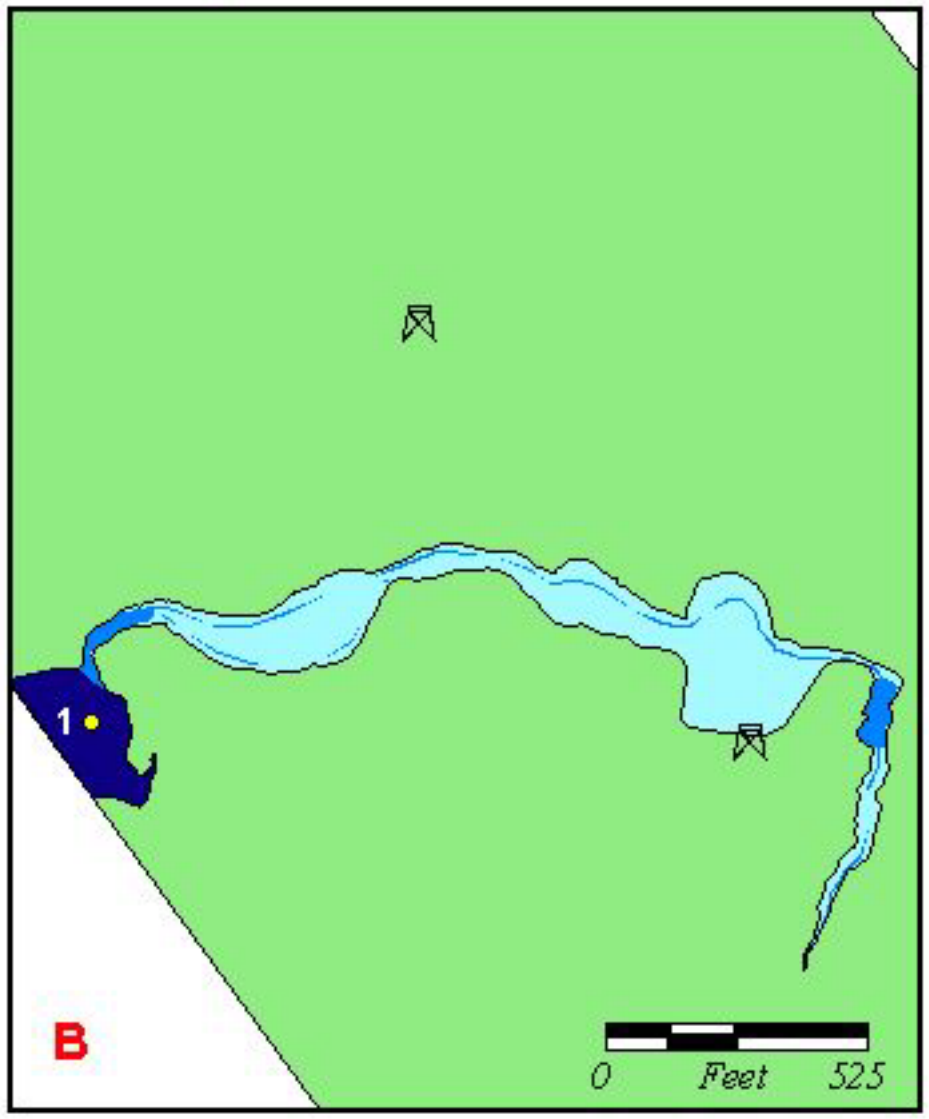
SER and BCP proposes to construct two double-circuit, 230-kV transmission lines from the existing SDG&E Imperial Valley Substation, continuing southerly approximately six miles to the U.S./Mexico border, where each line will connect with a corresponding transmission line in Mexico (Figure 5). The transmission lines will be carried on steel lattice towers from the border to just south of the Imperial Valley Substation, where steel monopoles will be used for each transmission line to allow the crossing of the Southwest Power Link. The Southwest Power Link is a 500-kV transmission line that enters the substation from the east at the substation's southeast corner. Suspended on the steel monopoles, the proposed transmission lines would be carried along the east side of the substation to enter it from the north, similar to the way the existing SDG&E transmission line is connected to the Imperial Valley Substation.

From the international border to just south of the substation, both the BCP and SER rights-of-way will be 120 feet wide and will parallel the existing SDG&E transmission line. The towers would be approximately 900 to 1,100 feet apart and would be roughly in line with the existing SDG&E towers in an east-west direction. Over the length of each proposed transmission line, 25 steel towers would be required.

At the substation, in order to clear the Southwest Power Link transmission line, the BCP right-of-way will diverge westerly to cross the Southwest Power Link on the west side of the last 500-kV tower. The SER line will continue northerly to cross the Southwest Power Link on the east side of the 500-kV tower. The SDG&E line, which passes under




RECON

Existing SDG&E transmission line
towers
poles

Culvert
Test pit

USACE Non-wetland Jurisdictional Waters of the U.S.
USACE wetland
Sonoran creosote bush scrub
Desert wash

Highway 98
Area surveyed

# FIGURE 4
## Jurisdictional Waters

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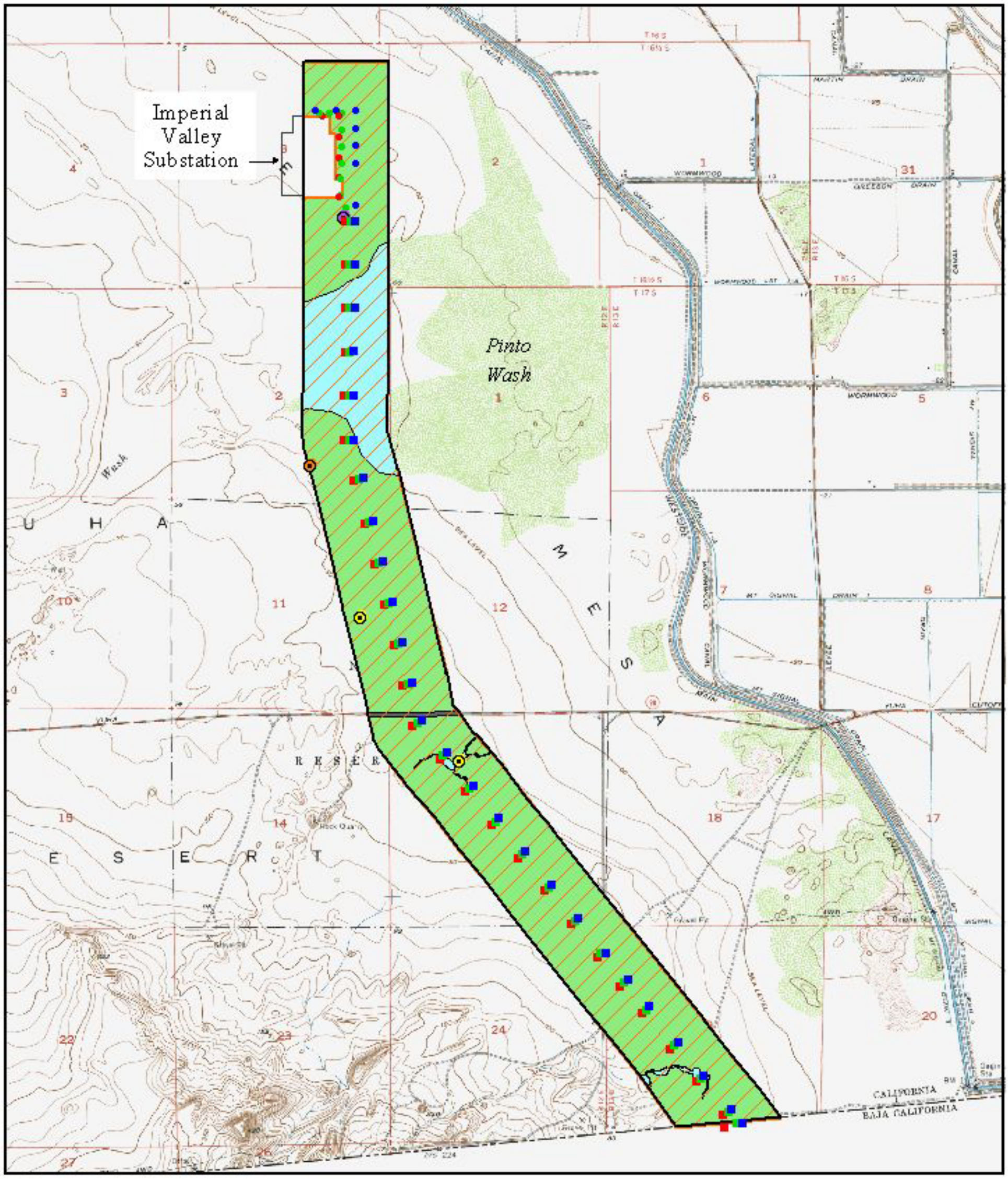


RECON

Project impacts
- Existing SDG&E facilities
- Proposed BCP facilities
- Proposed SER facilities

Sonoran creosote bush scrub
Desert wash
Western burrowing owl
Prairie falcon
Flat-tailed horned lizard
Known habitat of the Flat-tailed horned lizard
Highway 98

0 Feet 3500

# FIGURE 5

## Project Impacts to Existing Biological Resources

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the 500-kV transmission line west of the 500-kV tower, will have to be relocated about 60 feet west to allow room for the BCP transmission line to pass beneath the 500-kV tower. The BCP and SDG&E rights-of-way at this point will be 60 feet wide each and adjacent to each other. The SER line will continue in a 120-foot-wide right-of-way until it turns west at the northern corner of the substation. At this point the right-of-way is reduced to 70 feet and the alignment is located adjacent to the other two lines. In addition, the 50-foot-wide IID right-of-way, at the north end of the substation, will be relocated west to accommodate the new SER line.

Towers will be fabricated in segments in Mexico and carried to the construction site by helicopter. This will minimize the amount of laydown area required in the United States for tower construction. It is anticipated that the helicopter will only spend a maximum of 15 minutes at each location. The monopoles will be brought to the site by truck in sections, assembled in laydown areas, and lifted into place using a 90-ton crane. Principal preparation at each tower and pole location will consist of preparing concrete foundation footings. Each tower will require four footings, one on each corner; a single footing will be needed for each monopole.

For each tower footing, a pit 3 to 4 feet in diameter would be excavated, approximately 15 feet deep. A reinforced concrete caisson would be cast in place in the excavated pit extending to above the ground surface. The base segment will be lowered to the anchors and bolted in place by workers on the ground. Then the upper segment will be flown to the site and bolted to the lower segment.

The steel monopoles will be anchored in concrete footings poured in place. The footings will be approximately 8 feet in diameter and 25 feet deep for suspension poles, and about 10 feet in diameter, for dead end and corner poles.

To safely secure the SER conductors at the crossing of the Southwest Power Link, A-frame structures will be used. A pair of A-frames on the north and south sides of the Southwest Power Link will be required for each circuit, for a total of four. Each A-frame will consist of two angled legs on each end, joined at the top to support a crossbar. Each leg of the A-frames will be bolted to a cylindrical concrete footing about 32 inches in diameter. A total of 16 footings would be needed for the A-frames. Holes for the pole and A-frame footings will be excavated using an auger. Guy wires will be needed to support the corner poles.

Both the SER and BCP lines will have two static wires atop the towers and poles above the conductors, one on each side. These optical ground static wires will include the initial installation of communications fiber (fiber-optic cable) for system monitoring, with additional black fiber for future communications use. At the 500 kV line crossing, these optical cables will be carried down the two poles on the SER and BCP lines on each side

of the 500-kV line, buried in a trench from pole to pole under the 500-kV line, and carried back up the pole on the opposite side of the 500-kV line.

For the lattice towers, there will be 12 pull sites for each transmission line route, for a total of 24 pull sites. The pull sites will be paired on each side of six towers in the BCP and SER transmission lines and will largely overlap with the projected work areas for each tower.

## 2. Proposed Project Impacts

The impact analysis presented in this document is based on a number of assumptions using the preliminary proposed project design. These assumptions are stated below. The assessment below is intended to indicate the scale of possible impacts and serve as a basis for the general calculation of mitigation requirements. It should be noted that many areas of temporary disturbance, such as work areas around towers or poles and pull sites, will certainly overlap at least partially, so the total estimate for temporary impact area is overestimated and therefore conservative (worst-case). There is a potential that the placement of the towers or access road alignment will be revised as the project design is refined. A reassessment of impacts may be required to assure that a project redesign does not result in additional impacts to sensitive biological resources.

### a. Permanent Impacts

Areas of permanent impact will be those areas where the surface of the ground would be permanently disturbed. Specifically, new access roads and footings or anchors for tower, monopole, or crossing structures are areas that will be permanently impacted.

Permanent impacts will include the placement of concrete footings into the ground at each tower and pole location. Each tower footing will result in impact to approximately 12.56 square feet of the surface. Therefore, at each tower site, the permanent impacts would be a total of 50.24 square feet. For the steel suspension monopoles, the footings will have a surface area of about 50.25 square feet. There will be a total of 15 suspension poles in all four lines. Dead end or corner monopoles that will be placed at the end points and anywhere the line turns will have a footing area of about 78.50 square feet. There are a total of nine dead end or corner poles. The A-frame structures for the SER crossing will have 16 footings that would impact a total surface area of about 5.30 square feet each.

New roads will be needed to access the additional transmission lines resulting in additional permanent impacts. The towers, as presented in the current project design, line up very nearly in a straight line from west to east (roughly perpendicular to the right-of-way centerlines). Roads will be constructed by grading and compacting the existing soil. To minimize ground disturbance, it is proposed that access roads to each of the BCP and SER towers be constructed by extending "spurs" from the existing, mainline north-south

SDG&E access road eastward. This means that, allowing for some variation in a straight-line connection, approximately 250 linear feet of new access road would be needed at each of the 25 tower locations. Assuming that graded access roads would be 12 feet wide, approximately 3,000 square feet of access roads would be needed at each tower location. The access roads to the monopoles could be configured a number of ways. There are a number of roads already present in the area east of the substation that might be used. If it is assumed for worst-case impact assessment that all new roads would be needed to access each structure location, and that the new roads would be configured in a way to minimize impacts, a total of about 5,650 linear feet would be required to access all poles. If the access roads are 12 feet wide, this equates to approximately 67,800 square feet or less than 1.56 acres of permanent impact for access roads associated with the poles would result. An assumption has been made that approximately two-thirds of these roads will occur within the work area for the BCP, SDG&E, and IID lines for a total permanent impact of approximately 45,200 square feet (1.04 acres). The projected impacts for access roads along the SER monopole portion of the line would be approximately 2,600 square feet (0.52 acre).

### b. Temporary Impacts

Areas of temporary impact are areas where construction activity may take place but where restoration of the surface is possible. These areas include the work areas used to erect the towers, monopoles, or crossing structures; pull sites; laydown areas for the monopoles; and the trenches for the optical cables under the 500-kV transmission line at the substation. In some places, areas of temporary disturbance will overlap.

Areas of temporary impact at each tower will include a work area around each tower that would include the area of excavation for the anchors. No laydown areas will be needed for the towers, since the tower sections will be delivered into the work area by helicopter after assembly in Mexico. Suspension towers will require a work area 52 feet by 52 feet, or 2,704 square feet, around each suspension tower. Subtracting the 16 square feet of permanent impact area from this total yields 2,688 square feet, or 0.06 acre, of temporary impact for the work area at each suspension tower. Twenty towers on each line will be suspension towers.

Five deflection or dead end towers would be needed in each of the new transmission lines at the end points of the lines and at each location where the line turns. The work area at each deflection or dead end tower would be 62 feet by 62 feet, or 3,844 square feet. Subtracting 16 feet of permanent impact area, the temporary impact for work area at each deflection or dead end tower would be 3,828 square feet.

In addition to the work area, 12 pull sites for each transmission line (a total of 24 for both lines) for the lattice towers would add to the area of temporary disturbance. The lattice tower pull sites would be 30 feet by 50 feet or 1,500 square feet, centered on the

crossarms beneath the towers. This is a conservative estimate, since there would be considerable overlap of work areas and pull sites.

It is reasonable to regard the entire corridor containing the BCP and relocated SDG&E and IID transmission lines in this location as a construction site rather than discrete areas of activity for the purpose of evaluating temporary impacts. (Discussion of potential impacts of the SER line in the area east and north of the IV Substation is provided below.) So regarded, the corridor is about 2,500 feet long and 120 feet wide along the east side of the substation and about 600 feet long and 190 feet wide along the north side of the substation, covering about 414,000 square feet or about 9.5 acres. It is likely that not all of this corridor will be disturbed, but for the reasons stated above, it is difficult to determine at this time precisely how much disturbance will occur, or where. This method for calculating impacts results in a conservative overestimation of the impacts in this area. The area should be considered an area of potential environmental effect within which impacts will occur to a smaller total area.

Since the SER line would be 400 to 500 feet east of the BCP line to clear the Southwest Power Link tower, it would not be included in the SDG&E/BCP corridor on the east side of the substation, so that evaluating discrete areas of temporary impact is more appropriate for the SER line along this area. At the southern dead end pole on this segment an area centered on the pole, 90 feet wide, and 50 feet long would include both pull sites and a work area. This would amount to 4,500 feet, or about 0.10 acre. At the northeastern corner pole an area centered on the pole and 90 feet square would include all four pull sites and a work area. This would amount to 8,100 square feet or about 0.19 acre. Three of the remaining SER suspension poles and the two pairs of A-frame structures work area around each pole will require a work area of about 25 feet in diameter per pole and about 25 feet by 135 feet for each pair of A-frames. The total work areas of these dimensions would be about 8,220 square feet or about 0.19 acre. Additional areas of temporary disturbance in this segment would result at laydown areas. A laydown area about 50 feet by 150 feet, or about 7,500 feet, would be needed at each pole location. For these seven locations along the SER line, the total work area is approximately 1.21 acres of temporary impact. The remaining two poles within the SER line (one suspension and one dead end) are located north of the substation adjacent to the BCP and SDG&E lines and are included in the larger work area described above.

At the Southwest Power Link crossings, the static optical cables for the SER and BCP lines would be brought down the monopole south of the 500-kV line crossing and placed underground in a trench to cross the 500-kV line to the monopole north of the 500-kV line, and there brought back up the monopole to the upper crossarm. The trench will be relatively shallow and will be dug by hand. In the BCP/SDG&E line area, the trench temporary impacts are included in the construction corridor described above. In the SER corridor, the area of temporary impact for trenching will be about 3 feet wide and 900 feet long, about 2,700 square feet or 0.06 acre.

# B. Vegetation Communities

Table 5 presents the temporary and permanent impacts for each vegetation community within the proposed transmission line corridors. These numbers were calculated using the above-stated assumptions of impacts. Figure 5 illustrates the project impacts.

The proposed design will permanently impact approximately 3.10 acres of Sonoran creosote bush scrub and 0.28 acre of desert wash. Temporary impacts will be approximately 14.96 acres of Sonoran creosote bush scrub and 0.46 acre of desert wash. The temporary impact calculations for the Sonoran creosote bush scrub also includes the 9.5 acres calculated as the maximum work area for the BCP, SDG&E, and IID lines along the east and north of the Imperial Valley Substation. The actual area of impact will likely be smaller than this amount. In addition, the calculation of impacts for both vegetation communities includes the temporary impacts resulting from the 24 pull sites required for stinging the lines along the lattice towers. This acreage includes overlap with the projected work area at each tower location and represents a conservative estimate of impact acreage.

While neither of these communities is considered to be sensitive and impacts are generally considered less than significant; the project design may employ the use of water for air quality control measures during construction. This could encourage the invasion of non-native, invasive species which would be considered a impact.

# C. Wildlife

Some impacts to general wildlife associated with the project may occur. Birds have a high mobility and will most likely move out of the way during construction. Small mammals and reptiles with low mobility may be inadvertently killed during construction of the project. After project completion, a minimal amount of habitat will have been lost for general wildlife species. Impacts on general wildlife are considered less than significant.

# D. Sensitive Biological Resources

## 1. Sensitive Vegetation Communities

The proposed project will not impact any sensitive plant communities.

**TABLE 5**
**PROJECT IMPACTS**
**(acre)**

| Resource | BCP Transmission Line (including SDG&E and IID) | | SER Transmission Line | | Total (Temporary/Permanent) |
|---|---|---|---|---|---|
| | Temporary Impacts | Permanent Impacts | Temporary Impacts | Permanent Impacts | |
| Sonoran Creosote Bush Scrub | 11.38[1] | 1.82 | 3.58 | 1.28 | 18.06 [1] (14.96/3.10) |
| Desert Wash | 0.21 | 0.13 | 0.25 | 0.15 | 0.74 (0.46/0.28) |
| TOTAL | 11.59 | 1.95 | 3.83 | 1.43 | 18.80 (15.42/3.38) |
| Jurisdictional Waters of the U.S. | 0.06 | 0.04 | 0.07 | 0.04 | 0.21 (0.13/0.08) |

[1]Acreage of temporary impact includes the construction corridor for work on the BCP, SDG&E, and IID lines which will temporarily impact a maximum of 9.5 acres.

## 2. Sensitive Plant Species

There are no federally or state listed candidate, proposed, threatened, or endangered plant species expected to occur within the survey area. There will be no impacts to any of these species.

The project will potentially disturb 23 plant species that are included on the CNPS Lists if they are located within any of the work areas. The project will permanently impact only 3.38 acres of potential habitat for sensitive plant within the entire six miles of transmission line corridors. Temporary impacts will potentially affect a maximum of 15.42 acres within these same corridors. The temporary impacts will have some flexibility in areas of exact impact. The project proponents have designed construction to include the presence of a biological monitor during all grading operations. This monitor can assist construction crews in avoiding any sensitive plants that may be present within the construction areas by directing work away from the resource within the temporary work areas. Given the small amount of impact to the proposed project and the proposed presence of a biological monitor during construction, the impacts to these species are expected to be less than significant.

## 3. Sensitive Wildlife

### a. Flat-tailed Horned Lizard

The proposed project will temporarily impact approximately 15.42 acres and permanently impact approximately 3.38 acres of habitat known to be occupied by the flat-tailed horned lizard.

### b. Western Burrowing Owl

There is a potential that the proposed project would impact active burrows of the western burrowing owl.

### c. Prairie Falcon

The prairie falcon is not expected to nest on-site. No significant impacts will occur to this species.

### d. Other Sensitive Species

There is a potential for several other sensitive wildlife species to occur within the survey area. None of these species are listed as a candidate, proposed, threatened, or endangered species by either the federal or state regulatory agencies. The proposed project is not expected to reduce any of these species to less than a self-sustaining level. Impacts would be less than significant.

## E. Wildlife Movement Corridors

The survey corridor is not being used as a movement corridor by wildlife. There are no impacts to wildlife movement corridors.

## F. Jurisdictional Areas

The proposed project is expected to impact a total of 0.21 acre of USACE non-wetland jurisdictional waters of the U.S., which includes both temporary and permanent impacts (see Table 5 and Figure 6). There will be no impacts to wetlands.

Any future project revisions should be designed to avoid increasing the amount of impact to non-wetland jurisdictional waters. Several of the work areas for the southern lattice towers, as currently placed, are within approximately 60 feet of non-wetland jurisdictional waters. An effort should be made in future redesigns to minimize all impacts to jurisdictional waters and maximize the distance of each tower from these areas.

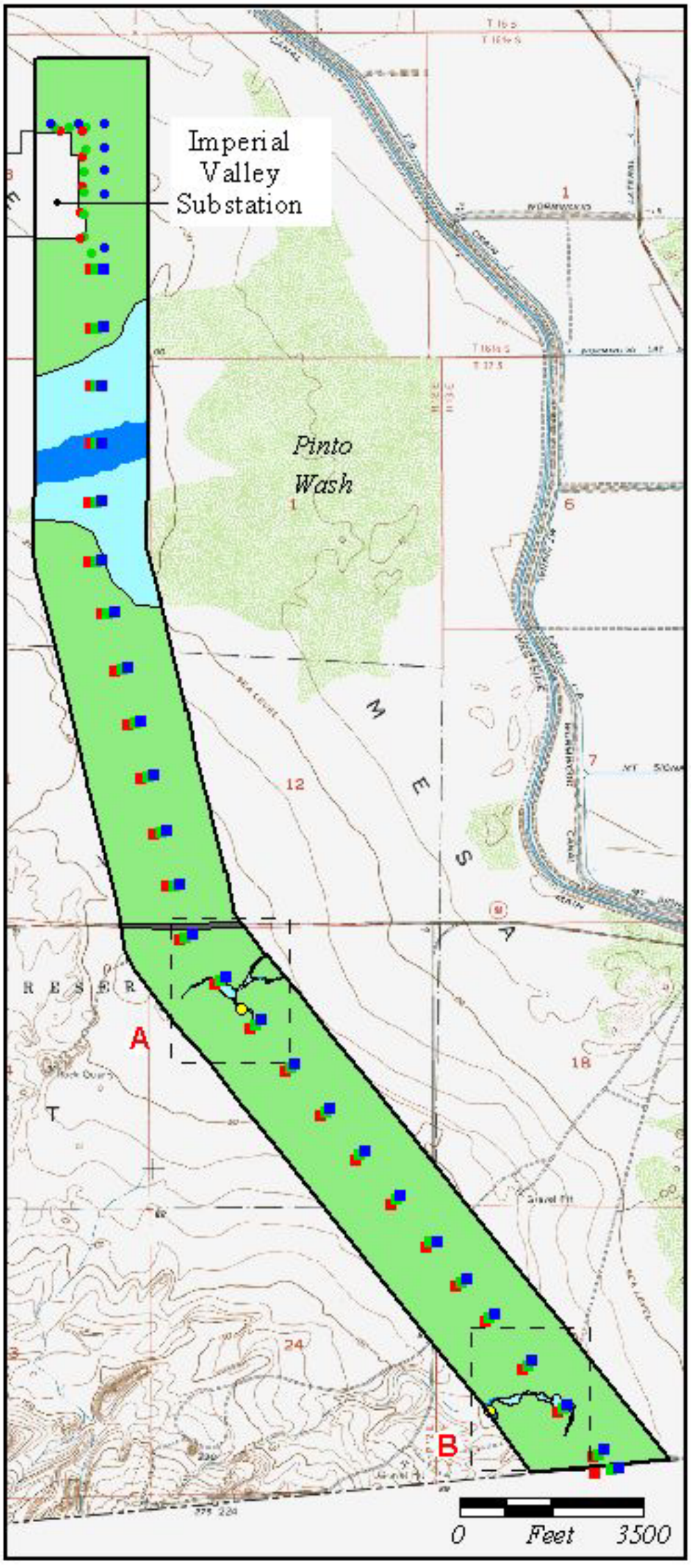
## G. Cumulative Impacts

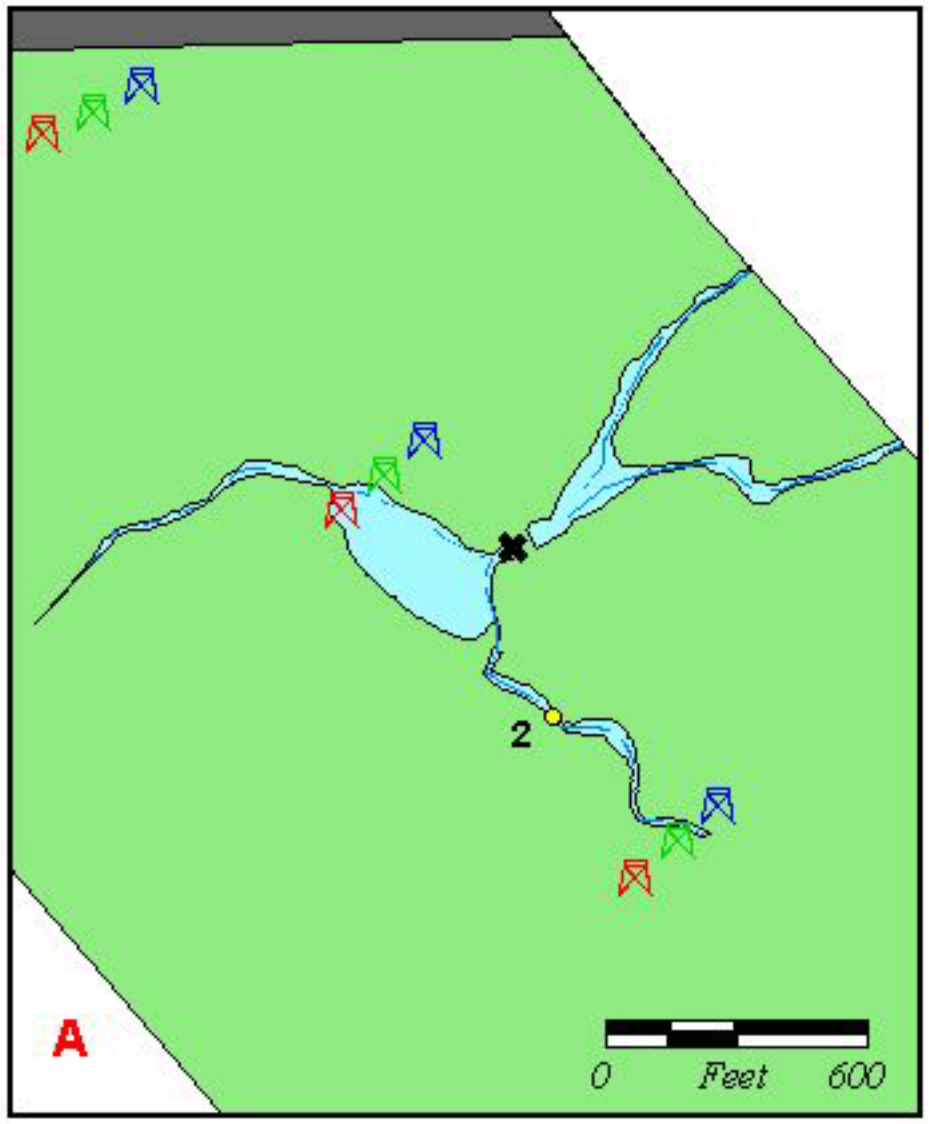
In the project area, there is clear evidence of off-road vehicle activity connected to the access roads for the SDG&E transmission line. This may be due to both legal (Border Patrol) and illegal activity. The proposed project will not create any new access from SR-98, but will extend access road spurs eastward from the SDG&E access roads. These spurs could increase the disturbance of biological resources by creating new access routes into the desert. The amount of the additional disturbance is impossible to estimate, and given the large tracts of vacant desert surrounding the project area, is probably impossible to prevent.

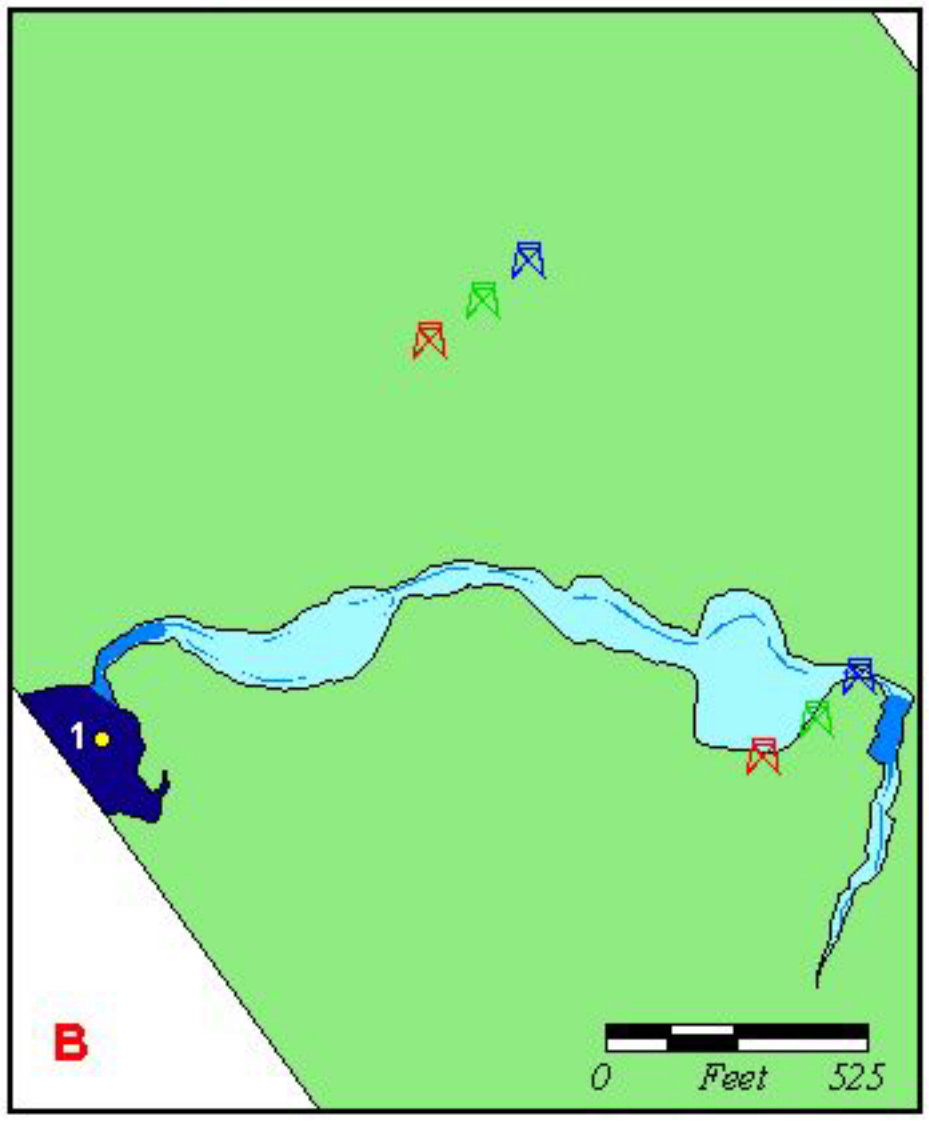
Exotic, invasive species, such as tamarisk, are present in a few areas within the survey corridor. The proposed activities of this project, including the general disturbance of the soil surface and the use of water for dust control, may encourage the growth of these non-native invasive species. This could potentially impact the quality of the native biological resources.

# Mitigation Measures

Permanent impacts will result from the clearing of vegetation without opportunity for restoration related to access roads and support structure footings. Temporary impacts in work areas due to the activities of workers and equipment may be suitable for mitigation by restoration.




RECON

Culvert
Test pit

Project impacts
Existing SDG&E facilities
Proposed BCP facilities
Proposed SER facilities

USACE Non-wetland Jurisdictional Waters of the U.S.
USACE wetland
Sonoran creosote bush scrub
Desert wash

Highway 98
Area surveyed

FIGURE 6
**Project Impacts to Jurisdictional Waters**

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Several features of the project, as proposed by the applicants and described below, will be effective in avoiding, minimizing, and mitigating impacts to biological resources. These include positioning the lattice towers and locating the access roads so that permanent disturbance can be minimized. In addition, moving the tower assemblies to their locations in the line by helicopter, instead of assembling them on-site, will greatly reduce the amount of disturbance at each tower site.

# A. Vegetation Communities

To mitigate for the potential invasion of aggressive non-native plant species from the use of water for dust control, the following measures will be employed. Watering should only be employed when absolutely necessary to meet air quality standards and excessive watering should be avoided. In addition, all invasive vegetation along the east side of the Imperial Valley Substation, including a stand of tamarisk trees, shall be removed from this area and the area shall be restored as much as possible to its original, pre-disturbed state. A biological restoration plan will be prepared and shall include provisions for monitoring all areas used for construction and for the removal of invasive species, on a schedule acceptable to the BLM. The restoration plan must include a minimum of three years of control for tamarisk and other exotics following construction.

# B. Sensitive Plant Species

As described above, the presence of a biological monitor during grading who can assist the construction crews in minimizing impact to any sensitive plant species that might be present within the temporary work areas will reduce impacts to sensitive plant species to less than significant. Impacts to sensitive plants would not require any further mitigation.

# C. Sensitive Wildlife

## 1. Flat-tailed Horned Lizard

The applicants have agreed to follow the measures listed in the "Flat-Tailed Horned Lizard Rangewide Management Strategy" to mitigate the effects of projects in the Yuha Desert Management Area, as well as other measures for the general protection of sensitive biological resources.

The applicants will attempt to schedule construction to occur as much as possible during the flat-tailed horned lizard's dormant period, November 15 to February 15, and will employ all mitigation measures recommended by the management strategy. Construction is to be completed in as short a time as possible to minimize the length of time that habitat will be disturbed by activity. Some construction will probably be necessary during the lizard's active period (before November 15 and after February 15), however, and if so,

the applicants will employ additional mitigation measures during that period. In addition, the applicants will employ mitigation measures intended to minimize and mitigate for general disturbance of biological resources, and assure restoration of disturbed areas.

Mitigation measures for these impacts are detailed in Appendix 3 of the Flat-tailed Horned Lizard Rangewide Management Strategy (Foreman 1997). These are summarized below. The mitigation measures shall be overseen by a project biologist who is familiar with the entire text and requirements of the mitigation measures outlined in Appendix 3 of the Management Strategy.

1. Construction will be scheduled to occur as much as possible during the flat-tailed horned lizard's dormant period, November 15 to February 15, and the construction schedule shall be approved by the BLM before construction begins.

2. A pre-construction worker education program will be developed and implemented. In addition, wallet-cards will be provided to all construction and maintenance personnel that includes information regarding the biology and status of the lizard; the protection measures that are being implemented; the function of the flagging around sensitive resources; reporting procedures if a lizard is found within the construction area; and methods of reducing impacts during commuting to and from construction areas.

3. A Field Contact Representative (FCR) shall be designated prior to the start of construction and approved by the BLM. The FCR will be responsible to ensure compliance with protective measures for the flat-tailed horned lizard and other sensitive biological resources and will act as the primary resource agency contact. The FCR shall have the authority to halt construction activities if the project is not in compliance with mitigation required by this EA.

4. The FCR shall coordinate with the construction manager to assure that all surface-disturbing activities are located as much as possible in areas that have been previously disturbed or where habitat quality is lower, and where disturbance to biological resources can be minimized.

5. All work areas will be clearly flagged or otherwise marked and all work will be restricted to these areas. All construction workers shall restrict their activities and vehicles to areas which have been flagged or to clearly recognizable areas such as access roads that have been identified as "safe" areas by the FCR.

6. A biological monitor shall be present in each area of active construction throughout the work day from initial clearing through habitat restoration, except where the project is completely fenced and cleared of horned lizards by a biologist (see measure 12 below). The biologist must have sufficient education and field

training with the flat-tailed horned lizard. This biologist will ensure that the project complies with these mitigation measures and will have the authority to halt activities if they are not in compliance. The biologist will inspect the construction areas periodically for the presence of flat-tailed horned lizards and will inspect any open trenches or pits prior to backfilling. The biologist will also work with the construction supervisor to take steps to avoid disturbance to the lizards and their habitat. If a lizard is discovered within an affected area, the lizard will be captured and relocated. The monitor will also excavate all potential flat-tailed horned lizard burrows within the construction areas and relocate any flat-tailed horned lizards encountered.

7. Only biologists authorized by the BLM may handle flat-tailed horned lizards. Any workers who discover flat-tailed horned lizards shall avoid disturbing the animals and shall immediately notify their construction supervisor and the biological monitor.

8. If a flat-tailed horned lizard is detected within an affected area, it should be relocated according to the measures detailed in Measure No. 9 of the Mitigation Measures section (Appendix 3) of the Management Strategy. Any relocation must be conducted by a biologist authorized by the BLM to handle the lizards.

9. The area of vegetation and soil disturbance shall be restricted to the smallest extent possible. When possible, equipment and vehicles should use existing surfaces or previously disturbed areas. When excavation or grading is necessary, the topsoil should be stockpiled and restored following completion of the work.

10. Existing roads shall be used to the greatest extent possible for travel and staging areas.

11. If desired by the BLM, newly created access roads shall be restricted by the construction of barriers, erecting fences with locked gates, and/or by posting signs. Maintenance access control facilities shall be the responsibility of the applicant for the life of the project (construction and operation).

12. Sites where prolonged construction activity, lasting several hours or more, will occur, and in which lizard mortality could occur, shall be enclosed with 0.5-inch wire mesh fencing to exclude the lizards from the site. This barrier fencing must be at least 12 inches above and below the ground surface and all entry gates should be constructed to prevent lizard entry. Once a fenced site has been cleared of flat-tailed horned lizards and fenced in this manner, an on-site monitor is no longer required.

13. For all areas disturbed by construction, a habitat restoration plan shall be developed by a qualified biologist, approved by the BLM, and implemented by the applicant. The restoration plan must address all of the items included in Measure No. 14 in Appendix 3 and in the Overview for Techniques for Rehabilitation of Lands in Appendix 8 of the Rangewide Management Strategy (Foreman 1997). The restoration plan shall include a schedule for monitoring and assuring the success of restoration, including the removal of invasive species, acceptable to the BLM. The restoration plan must include a minimum of three years of tamarisk (and other exotics) control following construction.

14. The FCR shall keep a record of the extent of all areas permanently and temporarily disturbed by construction. This record shall be the basis for determining a monetary compensation to be paid by the applicants to the BLM upon the completion of construction as required by Appendix 4 (Compensation Formula) of the Management Strategy. The BLM may require, prior to the beginning of construction, a reasonable deposit based on the extent of anticipated disturbance, with the final compensation to be determined according to the FCR's final record and the Compensation Formula in the Management Strategy.

For any construction occurring during the flat-tailed horned lizard's active period, before November 15 or after February 15, all of the measures listed above that are applicable shall be implemented. In addition, the following measures shall be required:

1. The FCR shall coordinate with the construction manager for the applicants to assure that vehicular traffic is kept to a minimum consistent with the practical requirements of construction.

2. Work crews shall not drive to the work site in the Management Area in individual vehicles. The applicant shall arrange for workers to park on State Route 98 or some other facility outside the Management Area and be driven together to the work site in a single vehicle (multiple trips for this collection vehicle are permitted). This limitation shall apply to the members of a work crew (two or more persons) who will be working together throughout the shift, except for emergencies.

3. All motor vehicles in the work area shall be accompanied by a biological monitor trained to recognize the flat-tailed horned lizard and approved by the BLM to walk in front of the vehicle when it is moving from place to place on access roads in order to remove lizards that may be in the path of the vehicle.

The FCR and biological monitors will keep a record of all sightings of flat-tailed horned lizards and fresh flat-tailed horned lizard scat. Sightings will be reported in writing to the BLM on a schedule established by the BLM.

Mitigation will also include contribution to a compensation fund that will be used to acquire lands and enhance habitat within flat-tailed horned lizard management areas (Foreman 1997). The mitigation ratio is calculated using the compensation formula provided in Appendix 4 of the Rangewide Management Strategy (Foreman 1997). A multiplying factor is calculated and applied to the number of affected acres to determine the level of mitigation required. For impacts to lands within a Management Area the multiplier ranges from three to six calculated based on other factors that include the extent of impact to adjacent lands, growth inducing factors of the project, and duration of the project effect.

Based on discussions with BLM staff, the mitigation multiplying factor will be 4.5. This breaks down as follows: 3 for the impact occurring within a designated flat-tailed horned lizard management area, 0.5 for the residual impacts to adjacent lands, and 1 for the fact that impacts will be long term (greater than 10 years). The current mitigation fee is $230 per acre. Based on these factors, the expected compensation fee would be $19,458 (18.80 acres of impact*$230/acre*4.5 multiplying factor). This amount must be paid prior to the start of construction.

## 2. Western Burrowing Owl

There is a potential that the proposed project would impact active burrows of the western burrowing owl. The breeding season for burrowing owls is between February 1 and August 31. Burrows can be occupied and active during both the breeding and non-breeding seasons. Avoidance of all disturbances to occupied burrows is preferred. A non-disturbance buffer of 160 feet during the non-breeding season and 250 feet during the breeding season should be maintained around each occupied burrow, when possible. It is preferable that construction take place between September 1 and January 31, to avoid impacts to breeding burrowing owls (State of California 1995).

Unavoidable impacts to occupied burrows must be mitigated using passive relocation methods, as described below. Relocation should be implemented within the non-breeding season only. If construction is to begin during the non-breeding season, a pre-construction clearance survey should be conducted within the 30 days prior to construction to identify whether any burrowing owl territories are present within the project footprint. The proposed construction areas will need to be identified in the field by the project engineers prior to the commencement of the pre-construction clearance survey. The survey should follow the protocols provided in the Burrowing Owl Survey Protocol and Mitigation Guidelines by the California Burrowing Owl Consortium (2001). A focused survey should be conducted which includes pedestrian surveys over the entire project site and areas within a 500-foot area around the area of impact. If burrows or burrowing owls are located, a burrowing owl census should be conducted. This includes night surveys of the areas around the identified burrows or owl sightings on four separate days to determine the number and locations of owls using the site.

If active burrows are present within the project footprint, the following mitigation measures should be implemented. Passive relocation methods are to be used to move the owls out of the impact zone. Passive relocation should only be done in the non-breeding season. This includes covering or excavating all burrows and installing one-way doors into occupied burrows. This will allow any animals inside to leave the burrow but will exclude any animals from re-entering the burrow. A period of at least one week is required after the relocation effort to allow the birds to leave the impacted area before construction of the area can begin. The burrows should then be excavated and filled in to prevent their reuse. An artificial burrow should be created beyond 160 feet from the impact area but contiguous with or adjacent to the occupied habitat.

The destruction of the active burrows on-site requires construction of new burrows at a mitigation ratio of 1:1 at least 50 meters from the impacted area and must be constructed as part of the above-described relocation efforts.

If construction is to begin during the breeding season, it is recommended that the above-described measures are implemented prior to February 1 to discourage the nesting of the burrowing owls within the area of impact. As construction continues, any area where owls are sighted should be subject to frequent surveys for burrows before the breeding season begins, so that owls can be relocated before nesting occurs.

Given the long, linear nature of this project, it is possible that these protocols will need to be repeated throughout the length of construction to ensure that additional burrowing owls have not moved within the areas of impact subsequent to the initial pre-construction clearance survey and relocation efforts. As the construction schedule and details are finalized, a qualified biologist should prepare a monitoring plan that will detail the methodology proposed to minimize and mitigate impacts to this species.

# D. Jurisdictional Areas

Impacts to non-wetland jurisdictional waters of the U.S. should be mitigated at a ratio consistent with federal regulatory agencies, which is typically 1:1, for a total of 0.21 acre. Temporary impacts of 0.13 acre will be mitigated by returning the area to the pre-construction contour and condition. Given that the permanent impacts are so small, 0.08 acre, it is recommended that enhancement of the survey corridor through removal of the non-native invasive tamarisk be conducted. This should be conducted along the eastern edge of the Imperial Valley Substation which would account for an area of at least 0.10 acre in size. Additional tamarisk could be removed from the southern wetland area, if necessary. A restoration plan will be prepared detailing the proposed mitigation for impacts to jurisdictional waters. This plan will include a minimum of three years of control for tamarisk and other exotics following construction to ensure that these species are not allowed to establish within the impacted areas.

In addition, impacts to these waters will require a Section 404 permit from the USACE and a 401 certificate from the Regional Water Quality Control Board in accordance with the Clean Water Act. This project would be covered by Nationwide Permit (NWP) #12 which regulates all activities required for the construction of utility lines and associated facilities within waters of the U.S. This NWP covers all projects that do not exceed 0.5 acre of impact resulting from construction of the utility lines and associated access road. This project meets that threshold by impacting a maximum of 0.21 acre of jurisdictional waters.

## E. Cumulative Impacts

The impacts from the potential proliferation of roads through the Yuha Desert from the creation of new spur roads is difficult, if not impossible to mitigate. Given the large tracts of vacant desert surrounding the project area, is probably impossible to prevent. Barriers on the roads might actually exacerbate the problem, for instance, by simply encouraging disturbance of the adjacent desert to bypass the barriers. Increased signage at the access road entrances off Highway 98 and at each of the spur roads to the towers may assist in reducing the illegal off-road-vehicle use, though it is unlikely to affect the use of the area by the Border Patrol and other law enforcement entities. These residual impacts would likely remain following completion of the project and implementation of the above-described mitigation measures. It is impossible to quantify the residual impacts because of the nature of the impacts. The mitigation fee, as calculated above for impacts to the flat-tailed horned lizard habitat, was set at a higher ratio (increased from 3.5 to 4.5) to account for residual impacts on adjacent lands and was calculated for the entire project impact area. This additional fee will provide some offset for the impacts.

A biological restoration plan will be prepared to provide appropriate mitigation for the potential proliferation of exotic invasive species. This plan will include a minimum of three years of control for tamarisk and other exotics following construction to ensure that these species are not allowed to establish within the impacted areas.

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# ATTACHMENTS

# ATTACHMENT 1

**ATTACHMENT 1**
**PLANT SPECIES OBSERVED**

| Scientific Name | Common Name | Habitat | Origin |
|---|---|---|---|
| *Abronia villosa* var. *villosa* S. Watson | Verbena | DW | N |
| *Acacia greggii* A. Gray | Catclaw acacia | CS, DW | N |
| *Ambrosia dumosa* | Burro-weed | CS | N |
| *Aristida purpurea* Nutt. | Purple three-awn | DW | N |
| *Atriplex canescens* ssp. *linearis* (Parsh) Nutt. | Fourwing saltbush | DW | N |
| *Atriplex polycarpa* (Torrey) S. Watson | Saltbush | DW | N |
| *Bebbia juncea* (Benth.) E. Greene | Sweetbush | DW | N |
| *Bouteloua barbata* Lag. | Six-weeks grama | DW | N |
| *Chamaesyce* sp. | Prostrate spurge | CS | N |
| *Croton californicus* Muell.-Arg. | California croton | DW | N |
| *Datura sp.* Regel | Jimson weed | DW | N |
| *Encelia farinosa* Torrey & A. Gray | Brittlebush | CS | N |
| *Encelia frutescens* (A. Gray) A. Gray | Encelia | DW | N |
| *Ephedra californica* Wats. | Desert tea | CS | N |
| *Eriogonum inflatum* Torrey & Fremont | Desert trumpet | DW | N |
| *Hymenoclea salsola* A. Gray | Burrobrush | DW | N |
| *Isocoma acradenia* (E. Greene) var. *eremophila* (E. Greene) G. Nesom | Alkali goldenbush | DW | N |
| *Larrea tridentata* (DC.) Cov. | Creosote bush | CS | N |
| *Opuntia acanthocarpa* Engelm. & Bigel. var. *coloradensis* L. Benson | Buckhorn cholla | CS | N |
| *Oenothera deltoides* Torr and Frem. | Primrose | CS | I |
| *Olneya tesota* A. Gray | Ironwood | CS, DW | N |
| *Palafoxia arida* B. Turner & M. Morris | Spanish needle | CS | N |
| *Pectis papposa* Harvey & A. Gray var. *papposa* | Chinchweed | CS | N |
| *Petalonyx thurberi* A. Gray ssp. *thurberi* | Sandpaper plant | DW | N |
| *Phoradendron californicum* Nutt | Desert mistletoe | CS | N |
| *Plantago ovata* Forsskal | Wooly plantain | CS | I |
| *Pleuraphis rigida* Thurber | Big galleta | DW | N |
| *Prosopis velutina* Wooton | Velvet mesquite | CS, DW | N |
| *Psilostrophe cooperi* (A. Gray) Greene | Paper flower | DW | N |
| *Psorothanmus spinosus* (A. Gray) Barneby | Smoke tree | DW | N |
| *Psorothanmus emoryi* (A. Gray) Rydb. | White dalea | DW | N |
| *Stephanomeria pauciflora* (Nutt) Nelson | Wire lettuce | CS | N |
| *Tamarix* sp. | Tamarisk | DW | I |
| *Tiquilia plicata* (Torrey) A. Richardson | Tiquilia | CS | N |

HABITATS

CS = Sonoran creosote bush scrub
DW = Desert wash

OTHER TERMS

N = Native to locality
I = Introduced species from outside locality

# ATTACHMENT 2

**ATTACHMENT 2**
**WILDLIFE SPECIES OBSERVED/DETECTED**

| Common Name | Scientific Name | Occupied Habitat | Status | Evidence of Occurrence |
|---|---|---|---|---|
| Invertebrates (Nomenclature from Mattoni 1990 and Opler and Wright 1999) | | | | |
| Alfalfa butterfly | *Colias eurytheme* | CS, DW | | O |
| Monarch | *Danaus plexippus* | DW | | O |
| Painted lady | *Vanessa cardui* | CS | | O |
| Pigmy blue | *Brephidium exilis* | CS | | O |
| Reptiles (Nomenclature from Collins 1997) | | | | |
| Desert iguana | *Dipsosaurus dorsalis* | CS, DW | | O |
| Flat-tailed horned lizard | *Phrynosoma mcallii* | | CSC, BLM | O |
| Birds (Nomenclature from American Ornithologists' Union) | | | | |
| Red-tailed hawk | *Buteo jamaicensis* | F | | O |
| Prairie falcon | *Falco mexicanus* | CS | CSC | O |
| Western burrowing owl | *Speotyto cunicularia hypugaea* | DW | CSC | O |
| Northern flicker | *Colaptes auratus* | CS | | O |
| Common raven | *Corvus corax clarionensis* | CS | | O |
| Phainopepla | *Phainopepla nitens* | CS | | O |
| Rock wren | *Salpinctes obsoletus obsoletus* | CS | | O |
| Blue-gray gnatcatcher | *Polioptila caerulea* | CS | | O |
| Black-tailed gnatcatcher | *Polioptila melanura* | CS | | |
| Yellow-rumped warbler | *Dendroica coronata* | CS, DW | | O |
| White-crowned sparrow | *Zonotrichia leucophrys* | CS | | O |
| Mammals (Nomenclature from Jones et al. 1982) | | | | |
| Round-tailed ground squirrel | *Spermophilus tereticaudus tereticaudus* | CS | | V |
| Desert black-tailed jackrabbit | *Lepus californicus deserticola* | CS | | O |
| Cottontail rabbit | *Sylvilagus audubonii* | CS | | O |
| Coyote | *Canis latrans* | CS | | D, S |
| Desert kit fox | *Vulpes macrotis* | CS | | S |

Habitats

CS = Sonoran creosote bush scrub
DW = Desert wash
F = Flying overhead

Status

BLM= Bureau of Land Management
CSC = California Department of Fish and Game species of special concern

Evidence of Occurrence

V = Vocalization
O = Observed
S = Scat
D = Den site

# Wetland Delineation Report
# for the
# Imperial Valley to La Rosita 230-kV Line
# Imperial County, California

# WETLAND DELINEATION REPORT FOR THE IMPERIAL VALLEY TO LA ROSITA 230-KV LINE IMPERIAL COUNTY, CALIFORNIA

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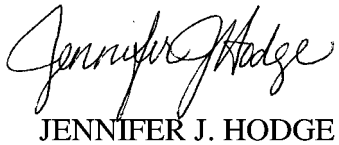

JENNIFER J. HODGE
BIOLOGIST

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AUGUST 28, 2001

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# TABLE OF CONTENTS



**FIGURES**



**ATTACHMENT**

# Summary of Findings

A wetland delineation was conducted within the corridor of the proposed San Diego Gas and Electric (SDG&E) 230-kilovolt (kV) line from the Imperial Valley Substation to the Mexican border in Imperial County, California. Methods for delineating wetlands follow guidelines set forth by the U.S. Army Corps of Engineers ([USACE] 1987). A total of 38.7 acres of jurisdictional waters of the U.S. (0.90 acre of wetlands and 37.8 acres of waters of the U.S.) were delineated according to USACE guidelines. This wetland delineation is subject to review and approval by the USACE.

Impacts to jurisdictional waters on the site will require a Section 404 permit from the USACE and a 401 certificate or waiver from the Regional Water Quality Control Board in accordance with the Clean Water Act. An analysis of project impacts is provided in the biological technical report for this project (RECON 2001).

# Introduction

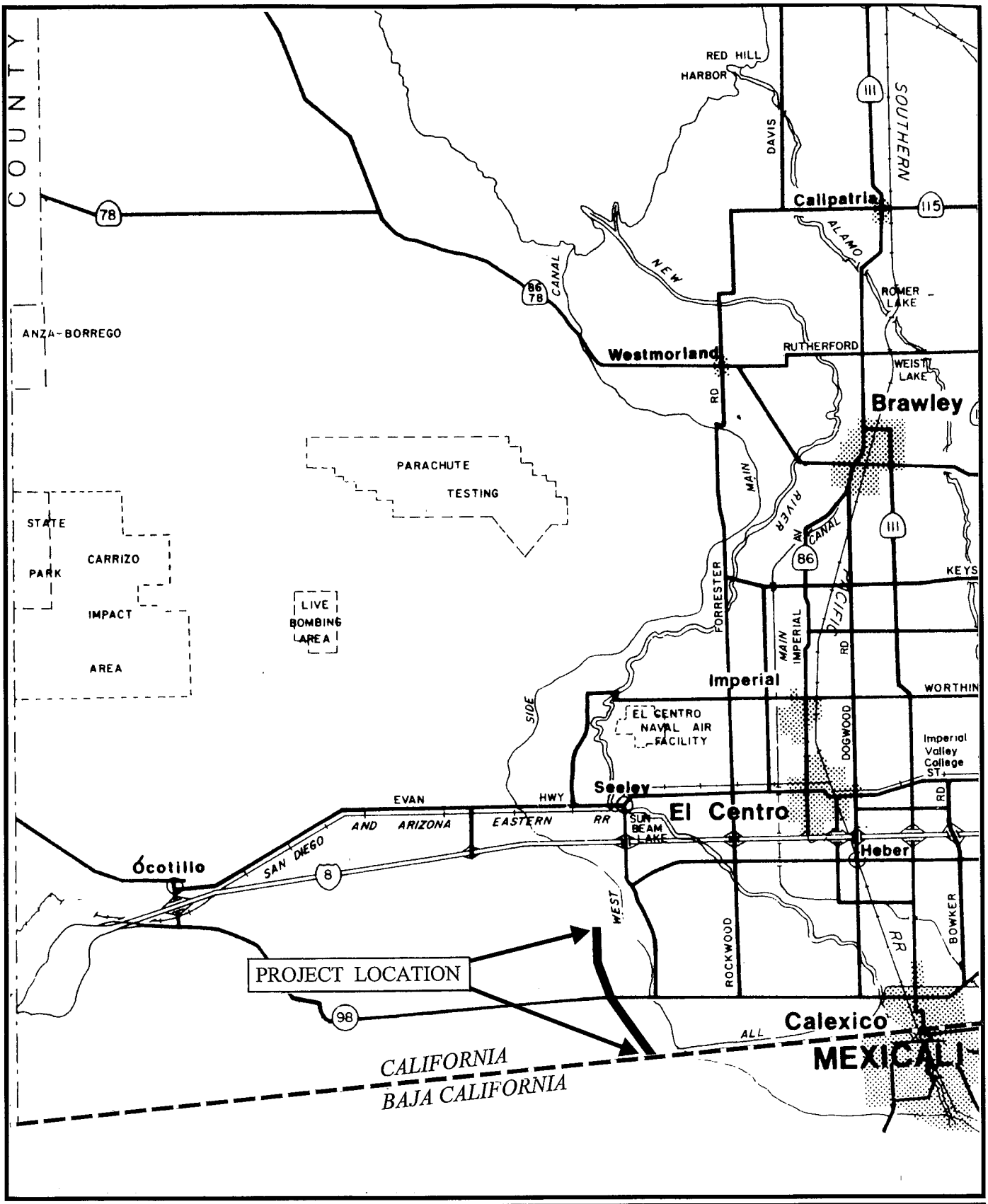
The proposed project is located in the Yuha Basin of the Colorado Desert in Imperial County, California, southwest of the town of El Centro (Figure 1). This project proposes to construct a 230-kV transmission line from the existing SDG&E Imperial Valley Substation, south approximately five miles to the U.S./Mexican border (Figure 2), where the Comision Federal de Electricidad (CFE) will construct the remaining three miles of the line to their La Rosarita Substation.

The project corridor is located completely on Bureau of Land Management (BLM) property and is bisected by Highway 98. The project area is located within portions of Section 3, Township 16½ South, Range 12 East, Sections 1, 2, 11, 12, 13, 14, and 24 of Township 17 South, Range 12 East, and Sections 18 and 19 of Township 17 South, Range 13 East on the Mt. Signal 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle (see Figure 2).

Wetland delineation data and background information required for environmental analysis by the USACE are included in this report. The biological technical report for the SDG&E 230-kV Line (RECON 2001) contains all other biological resource information for the project.

# Methods

The methodology for delineating wetlands used for this report follows guidelines set forth by the USACE (1987). Three criteria must be fulfilled in order to consider an area a




Source: California Dept. of Transportation

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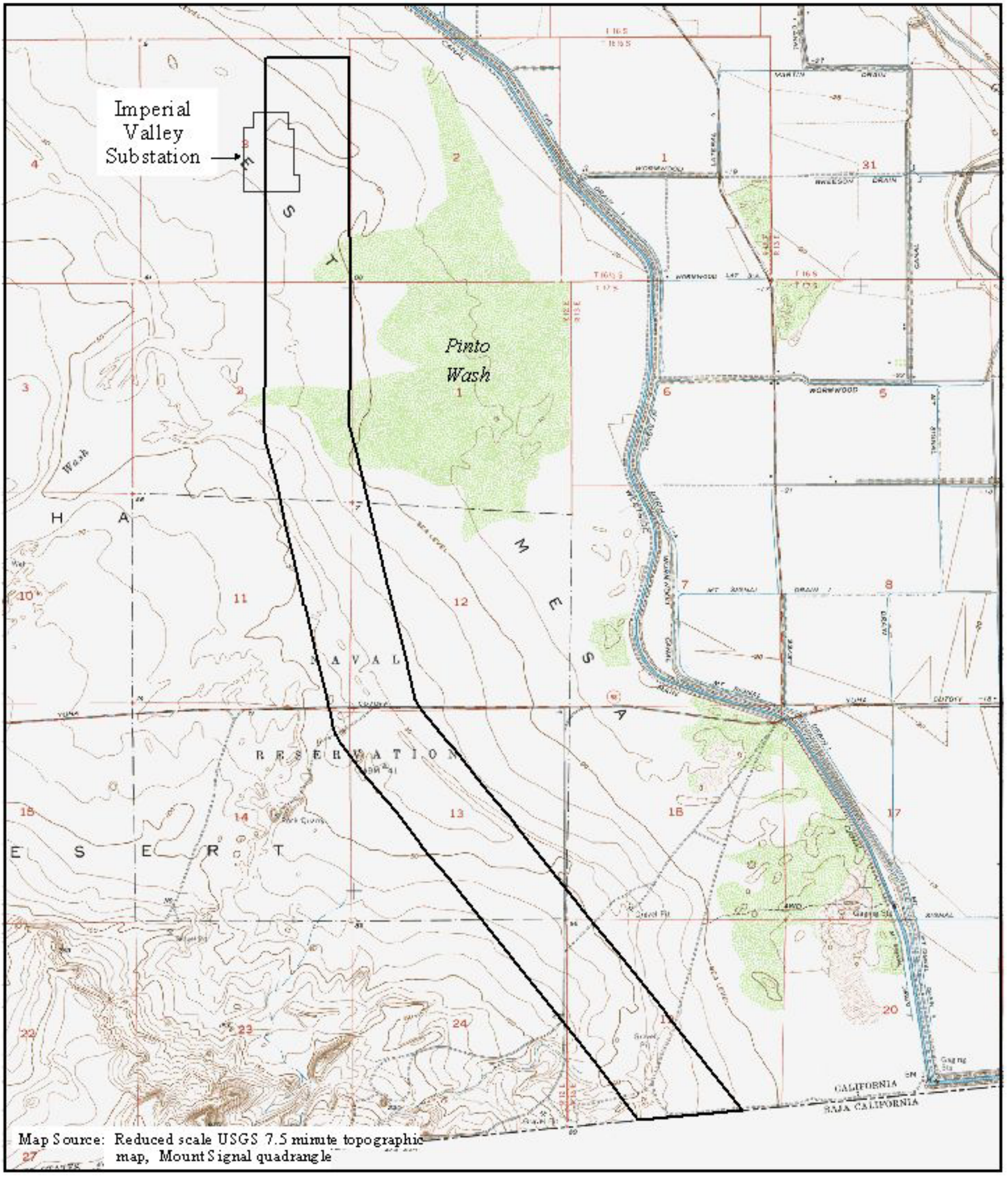
# FIGURE 1

## Location of the Project in Western Imperial County




Survey corridor

0 Feet 3500

# FIGURE 2

## Project Vicinity

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jurisdictional wetland: (1) the presence of hydrophytic vegetation; (2) the presence of hydric soils; and (3) the presence of wetland hydrology. Atypical wetland areas (disturbed wetlands) and problem area wetlands (e.g., seasonal wetlands) may lack one or more of the three criteria but could still be considered wetlands if background information on the previous condition of the area and field observations indicate that the missing wetland criteria were present before the disturbance and would occur at the site under normal circumstances. In addition, areas that displayed a prominent ordinary high water mark were also evaluated as potential non-wetland jurisdictional waters or disturbed wetland.

A routine on-site determination method (USACE 1987) was conducted on October 24 and 25, 2000 by Gerry Scheid and Jennifer Hodge to gather field data at potential wetland areas on the project site. The limits of the streambed were marked using global positioning system technology by RECON biologists Jennifer Hodge and Amy Elsnic on December 12, 2000.

# A. Hydrophytic Vegetation

Hydrophytic vegetation is defined as "the sum total of macrophytic plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content" (USACE 1987). The potential wetland areas were surveyed by walking the proposed project site and making observations of those areas exhibiting characteristics of jurisdictional waters or wetlands. Vegetation units with the potential to be wetlands were examined, the dominant plant species for each vegetation stratum (i.e., tree, shrub, herb, and vine) within the unit was determined, and the relative canopy cover of the species present was visually estimated. The dominant species from each stratum were then recorded on a summary data sheet along with the associated wetland indicator status of those species. The wetland indicator status of each dominant species was determined by using the list of wetland plants for California provided by the U.S. Fish and Wildlife Service (1997).

The hydrophytic vegetation criterion is considered fulfilled at a location if greater than 50 percent of all the dominant species present within the vegetation unit have a wetland indicator status of obligate (OBL), facultative-wet (FACW), or facultative (FAC) (USACE 1987). An OBL indicator status refers to plants that have a 99 percent probability of occurring in wetlands under natural conditions. A FACW indicator status refers to plants that occur in wetlands (67-99 percent probability) but are occasionally found in non-wetlands. A FAC indicator status refers to plants that are equally likely to occur in wetlands or non-wetlands (estimated probability 34-66 percent).

## B. Hydric Soils

Sample points were selected within a particular vegetation unit where the apparent boundary between wetland and upland was inferred based on changes in the composition of the vegetation. Soil pits were dug to a depth of at least 18 inches, as necessary, to determine soil color, evidence of soil saturation, depth to groundwater, and indicators of a reducing soil environment (e.g., mottling, gleying, sulfidic odor). Soil profiles exposed by these pits were compared to known profiles for soil types occurring in the region by referencing the local soil survey (U.S. Department of Agriculture [USDA] 1973). The order, group, and series for the soils present on the site were recorded. The local hydric soils list, obtained from the Soil Conservation Service, was checked to determine if any of the sampled soil types are considered hydric with respect to the conditions stated on the list.

The hydric soil criterion is considered fulfilled at a location if soils could be inferred to have a high groundwater table, evidence of prolonged soil saturation, or any indicators suggesting a long-term reducing environment in the upper 18 inches of the soil profile.

Information on the soil types sampled in the study area is summarized from the following sources: *Soil Survey, Imperial County, Imperial Valley Area* (USDA 1981), Soil Taxonomy (USDA 1975), and the local hydric soil list obtained from the Soil Conservation Service.

## C. Wetland Hydrology

Hydrologic information for the site was obtained by locating "blue-line" streams on USGS topographic maps, reviewing groundwater table elevation information from soil surveys, and directly observing hydrology indicators in the field (e.g., inundation, drift lines, sediment deposits, drainage patterns). Evidence of flows, flooding, and ponding were recorded and the frequency and duration of these events were inferred.

The wetland hydrology criterion is considered fulfilled at a location based upon the conclusions inferred from the field observations, which indicate that an area has a high probability of being inundated or saturated (flooded or ponded) long enough during the growing season to develop anaerobic conditions in the surface soil environment, especially the root zone (USACE 1987).

## D. Non-Wetland Jurisdictional Waters of the U. S.

Drainages, or portions thereof, that lack hydrophytic vegetation and/or hydric soils, but have distinct evidence of seasonal flows were classified as non-wetland jurisdictional

waters. The extent of the observed ordinary high water mark, as defined by the USACE under Section 404 of the Clean Water Act, was used to estimate the limits of these jurisdictional waters.

# Results of Field Data

A description of the major vegetation units observed, soil types encountered, and a discussion of the local hydrology in the project area are presented below. Copies of the field data forms are provided in Attachment 1.

Three areas were identified as potential jurisdictional areas: Pinto Wash in the northern portion of the project area, a wash directly south of State Route 98, and a complex of washes near the border in the southern portion of the project area.

## A. Vegetation

Figure 3 depicts the vegetation communities mapped on the project site. Two vegetation communities were identified within the survey area: Sonoran creosote bush scrub and desert wash. Hydrophytic plant species present in the wetland area is limited to tamarisk, a facultative plant species.

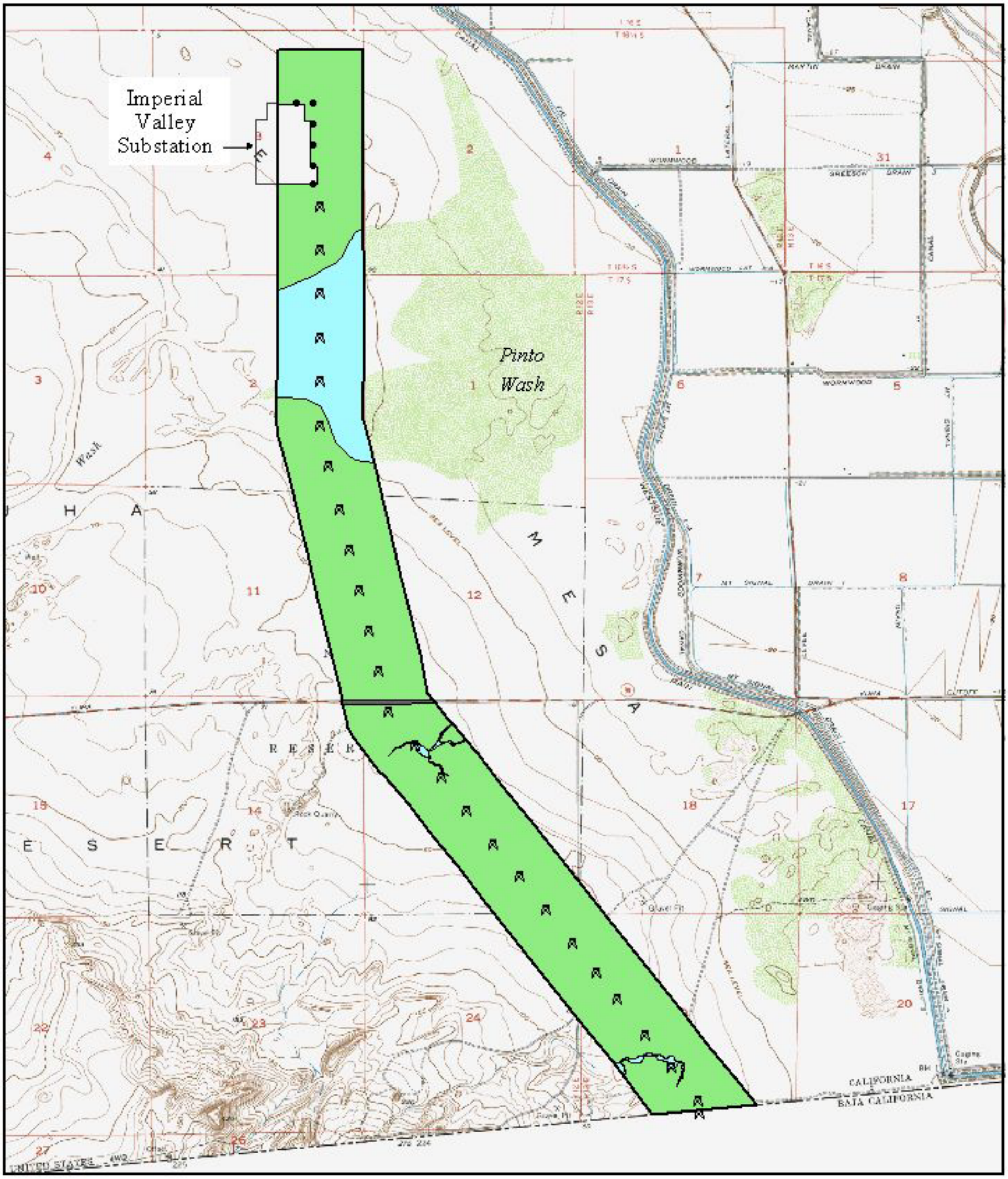
### 1. Sonoran Creosote Bush Scrub (1,097.5 acres)

Sonoran creosote bush scrub is the dominant vegetation community on the project site and accounts for approximately 1,097.5 acres within the survey corridor both north and south of State Route 98. The vegetation is open and relatively sparse, dominated by creosote bush (*Larrea tridentata*). Burro-weed (*Ambrosia dumosa*) and two species of saltbush (*Atriplex* spp.) were also common. Several trees, such as ironwood (*Olneya tesota*), velvet mesquite (*Prosopis velutina*), and catclaw acacia (A*cacia greggii*), are interspersed throughout the community, particularly in the southern half.

Creosote bush, the dominant plant species in this community, is considered an upland species, as are the majority of species found in this community. Velvet mesquite and cat claw acacia are facultative-upland (FACU) plant species, meaning they rarely (1 to 33 percent estimated probability) occur in wetlands.

### 2. Desert Wash (203.6 acres)

Desert wash is found in three distinct areas within the survey corridor for a total of 203.6 acres. The largest area is located near the northern boundary of the corridor and is a part of Pinto Wash. The dominant species in the wash is smoke tree (*Psorothamnus spinosus*) occurring with velvet mesquite, cat claw acacia, encelia (*Encelia frutescens*), verbena




RECON

# FIGURE 3

## Existing Vegetation Communities

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(*Abronia villosa* var. *villosa*), and big galleta (*Pleuraphis rigida*). The second of the three areas is located just south of State Route 98. This area includes the confluence of two streams, where a culvert and dam have been placed. The area directly downstream of the culvert has been heavily disturbed due to off-road-vehicle traffic. The road crosses the drainage at this location. Little to no vegetation is found in this disturbed area or east of the culvert. The two finger drainages west of the culvert support verbena, chinchweed (*Pectis papposa*), paper flower (*Psilostrophe cooperi*), and smoke tree (*Psorothamnus emoryi*). The southernmost area is an extension of an unnamed intermittent drainage that flows north from Signal Mountain just over the U.S.-Mexico border and then to the east into the survey corridor, where the drainage terminates. The western edge of this area contains a uniform stand of tamarisk while the remainder is primarily unvegetated with a few scattered shrubs. One large ironwood tree (*Olneya tesota*) occurs in this section of the drainage. A few scattered tamarisk (*Tamarix* sp.) are present in patches on the southern portion of the survey corridor.

The dominant plant species in the desert wash is smoke tree, an upland species. One large uniform patch of tamarisk is found in the southern end of the site. Tamarisk is a facultative (FAC) plant species, indicating it is equally likely (33 to 67 percent) to occur in wetlands and uplands.

# B. Soils

There are nine soil types present within the survey corridor, six of which underlie jurisdictional areas. The six soil types include Pits, Carsitas gravelly sand, Rositas sand, Rositas fine sand, Meloland fine sand, and Glenbar complex.

Pits refers to a soil type in which the upper layers of soil material have been removed to expose soil 3 to 20 feet below the natural surface. Drainage ranges from poorly drained to excessively drained. Runoff is slow and the erosion hazard is slight in this soil type. This soil type is found beneath the drainages near the border in the southern portion of the site.

Carsitas gravelly sand, 0 to 5 percent slopes occurs on alluvial fans and the bottoms of washes, from alluvium derived from granitic and metamorphic rocks. Carsitas soils are excessively drained, have rapid permeability, and slow surface runoff. The erosion hazard is slight. The upper 10 inches consist of pink gravelly sand, with strata of sand, coarse sand, and gravelly sand to 68 inches depth. Carsitas gravelly sand is the dominant soil type found in the southern portion of the site.

Rositas sand is common throughout the project area. It underlies a portion of each of the three on-site drainages. Rositas sand, 0 to 2 percent slopes, are deep soils which formed in alluvial sand from various sources. This sand is somewhat excessively drained. Permeability is rapid and surface runoff is slow. The erosion hazard is slight. This pink

and reddish yellow coarse sand is generally found in floodplains and basins to a depth of 27 inches. Fine sand lies beneath the coarse sand layer.

Meloland fine sand, which is found south of State Route 98 beneath a small portion of the central drainage, is a very deep sand formed from alluvial or eolian sediments. The sand is deep and well drained and is generally found in floodplains and alluvial basin floors. Permeability is slow and the erosion hazard slight. The winds can easily pick up this soil and blow it through the basin.

Glenbar complex is a very deep and well-drained soil. It is also formed in alluvial sediment. Its surface texture ranges from silty clay to gravelly sand, with alluvium deposits of fine sand common. Runoff in this soil type is slow; permeability is moderately slow. The erosion hazard is slight, but rills and gullies are common. Glenbar complex lies beneath the western portion of the central drainage.

Rositas fine sand, 0 to 2 percent slopes underlies the Pinto Wash area. Similar to the structure of Rositas sand, this soil type is also a very deep soil formed from alluvial or eolian sands from various sources. Permeability is rapid in this somewhat excessively drained soil. Surface runoff is slow and the erosion hazard is slight. Generally, this soil is reddish yellow fine sand and can be found to a depth of 60 inches. This fine sand has a high potential to blow.

# C. Hydrology

No USGS blue-line waters occur on the project site (see Figure 2). Off-site tributaries enter the site from the west at two locations before terminating on-site. The bed and bank and ordinary high water mark were apparent throughout most of the drainages on-site. Narrow (2 to 6 feet), but distinct, flow lines were observed within the wide channels. Evidence of wetland hydrology was present in the form of flow lines and sediment deposition and cracking, indicating ponding and subsequent drying.

Sheet flow is evident in Pinto Wash. Although no distinct ordinary high water mark was observed in the field, the evidence of flow is apparent on recent aerial photographs. A gradual transition of plant species and density of vegetation was used to demarcate Pinto Wash in the field.

The central drainage is likely an ephemeral stream that has been altered by the installation of a culvert and dam. The wide area west of the culvert has a dirt road traveling through it, and is therefore, disturbed.

# Jurisdictional Determination

Waters of the U.S. and wetlands, as defined by USACE, were delineated on-site. Based on information on soils, hydrology, and vegetation, observations made in the field, and data analysis, one wetland area (0.90 acre) was delineated in the study area. Since tamarisk is a facultative plant species, additional wetland indicators were used as support of conditions at the wetland area. Sediment deposits, flow lines, and cracks in the surface soil provide evidence of frequent ponding.

Three general areas were determined to support non-wetland jurisdictional waters of the U.S. The total area to be regulated by USACE is approximately 38.7 acres, 0.90 of which is a wetland. These areas are depicted in Figure 4.

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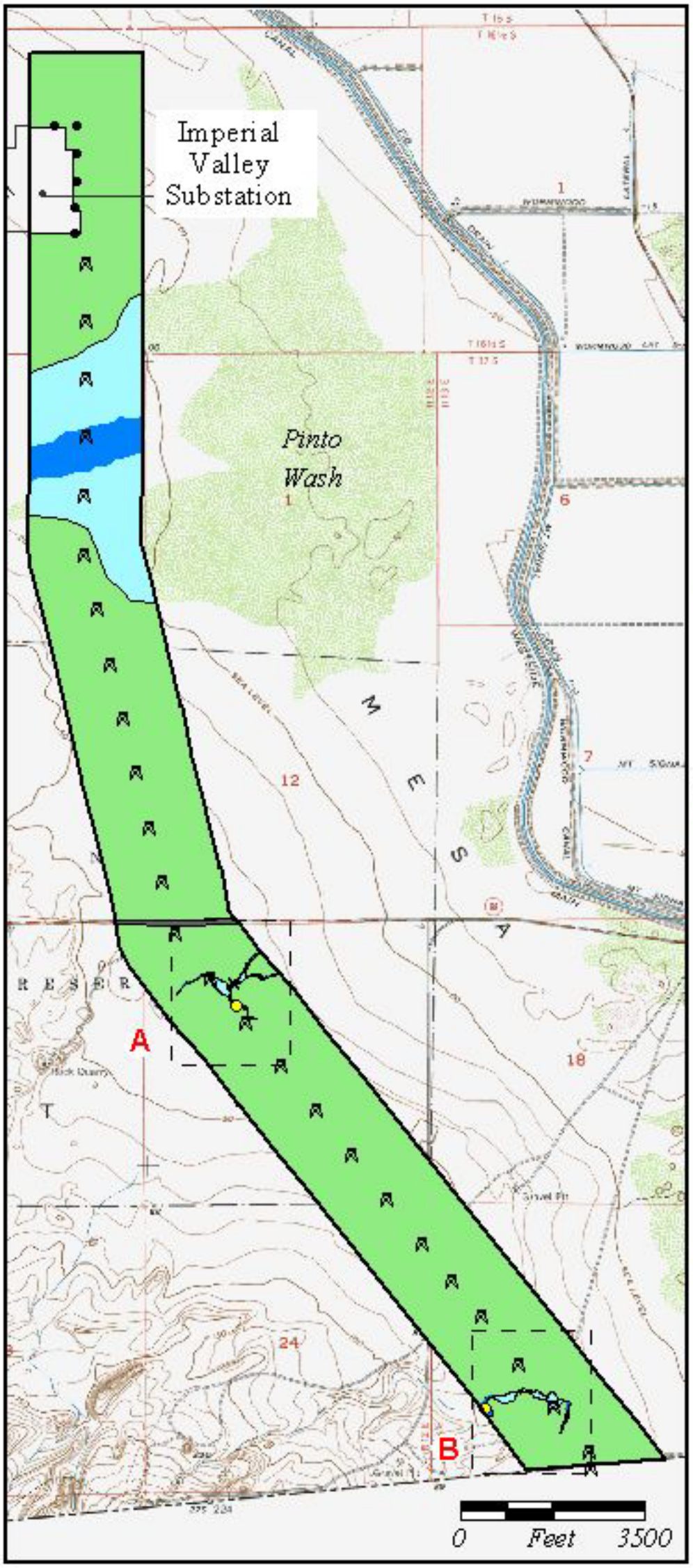
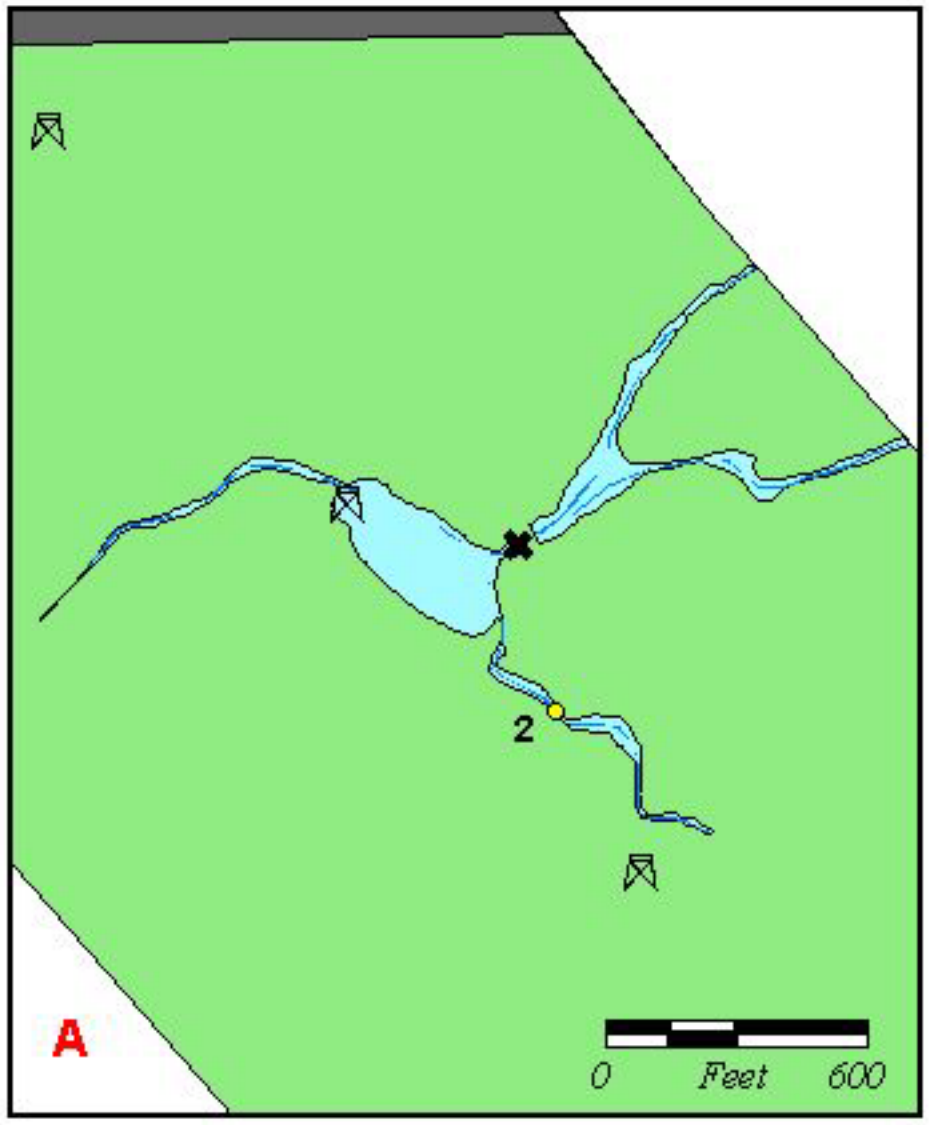
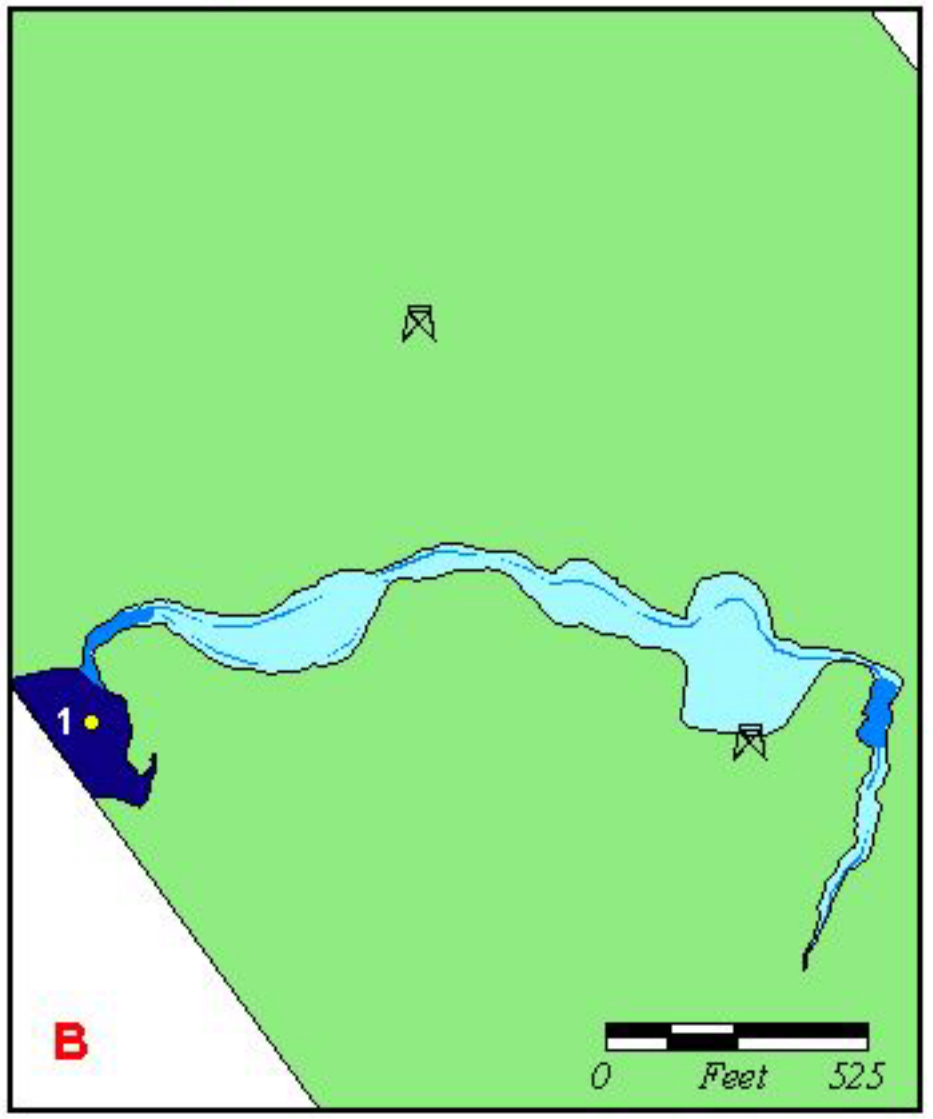
U.S. Fish and Wildlife Service

1997 National List of Vascular Plant Species that Occur in Wetlands: 1996 National Summary. Ecology Section – National Wetlands Inventory. March 3, 1997.




RECON

Existing SDG&E transmission line
towers
poles

Culvert
Test pit

USACE Non-wetland Jurisdictional Waters of the U.S.
USACE wetland
Sonoran creosote bush scrub
Desert wash

Highway 98
Area surveyed

# FIGURE 4
## Jurisdictional Areas

M:\job\6366\gis\mxd\fig4 (wet) final 08/28/01

# ATTACHMENT 1

**DATA FORM**
**ROUTINE ON-SITE DETERMINATION METHOD**

| | |
|---|---|
| Project/Site: Imperial Valley to Rosarita 230-kV Line (3366b)<br>Applicant/Owner: SDG&E<br>Investigator(s): J. Hodge; G. Scheid | Date: 10-24-00<br>County: Imperial<br>State: CA |
| Do Normal Circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (Atypical Situation)? ☐ Yes ☒ No<br>Is the area a potential Problem Area? ☐ Yes ☒ No<br>(if needed, explain on reverse or attach separate sheet.) | Community ID: Desert Wash<br>Transect ID:<br>Plot ID: 1 |

## VEGETATION

| Dominant Plant Species | Stratum | Indicator | Dominant Plant Species | Stratum | Indicator |
|---|---|---|---|---|---|
| 1. *Tamarix sp.* | T | FAC | 9. | | |
| 2. | | | 10. | | |
| 3. | | | 11. | | |
| 4. | | | 12. | | |
| 5. | | | 13. | | |
| 6. | | | 14. | | |
| 7. | | | 15. | | |
| 8. | | | 16. | | |

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100 percent

Remarks:
1. Assume presence of wetland vegetation? ☒ Yes ☐ No
2. Rooted emergent vegetation present? ☐ Yes ☒ No

## HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:
- Depth of Surface Water: N/A (in.)
- Depth to Water in Pit: > 18 (in.)
- Depth to Saturated Soil: > 18 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in: ☐ Upper 12" ☐ 13-18"
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in: ☐ Upper 12" ☐ 13-18"
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☒ Other (Explain in Remarks)

*Observations and Remarks:* Flow lines show in the sediment. Cracks in surface soil provide evidence of ponding.

1. *Filamentous or sheet forming algae present?* ☐ *Yes* ☒ *No*
2. *Slope:* ☒ *0-2%; or* ☐ *>2%*
3. *Oxidized rhizospheres:* ☐ *new roots only;* ☐ *old roots only;* ☐ *new and old roots,* ☒ *none*
4. *Flooding:* ☐ *none, flooding not probable;* ☐ *rare, unlikely but possible under unusual weather conditions;* ☒ *occasional, occurs on an average of once or less in 2 years; or* ☐ *frequent, occurs on an average of more than once in 2 years.*
5. *Duration:* ☐ *very brief, if <2 days;* ☐ *brief, if 2-7 days, or* ☒ *long, if >7 days*
6. *Site ponds water?* ☒ *Yes* ☐ *No*

## SOILS

| | |
|---|---|
| Map Unit Name (Series and Phase): Carsitas Gravelly Sand, 0 to 5 percent slopes<br><br>Taxonomy (Subgroup): Typic Torripsamments | Drainage Class: Excessively drained<br>Permeability: Rapid<br>Runoff: Slow<br>Field Observations:<br>Confirm Mapped Type? ☐ Yes ☒ No |

Profile Description:

| Depth (inches) | Horizon | Matrix Color (Munsell Moist) | Mottle Colors (Munsell Moist) | Mottle Abundance/ Contrast | Texture, Concretions, Structures, etc. |
|---|---|---|---|---|---|
| 0-18 | | 10 YR 4/4 | none | -- | Silty loam and sand |
| | | | | | |
| | | | | | |

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

*Oberservations and Remarks:* Areas where ponding occurs contains some clay loam. Smaller channels of flow within the tamarisk.

1. *Smell:* ☐ *Neutral;* ☐ *Slightly fresh; or* ☒ *Freshly plowed field smell*
2. *Site:* ☐ *Irrigated;* ☐ *Land leveled;* ☐ *Ditch drained;* ☐ *Pumped;* ☐ *Graded to drain via slope*
3. *Soils:* ☒ *do* ☐ *do not become frequently ponded or saturated for long (>7 days) to very long durations (>30 days) during the growing season*

## WETLAND DETERMINATION

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | ☒ Yes | ☐ No | Is this Sampling Point within a Wetland? ☒ Yes ☐ No |
| Wetland Hydrology Present? | ☒ Yes | ☐ No | |
| Hydric Soils Present? | ☒ Yes | ☐ No | |

*Remarks:*

1. *Possibly water of the U.S.?* ☒ *Yes* ☐ *No*
2. *Possibly exempt from Corps/EPA Regulation?* ☐ *Yes* ☒ *No (If yes, check item(s) below.)*
   - *(a)* ☐ *Non-tidal drainage and irrigation ditches excavated on dry land*
   - *(b)* ☐ *Artifically irrigated areas which would revert to upland if the irrigation ceased.*
   - *(c)* ☐ *Artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing.*
   - *(d)* ☐ *Artifical reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthic reasons.*
   - *(e)* ☐ *Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States (see 33 CFR 328.3(a)).*

Approved by HQUSACE 3/92

Additional Comments/Remarks:

**DATA FORM**
**ROUTINE ON-SITE DETERMINATION METHOD**

| | |
|---|---|
| Project/Site: Imperial Valley to Rosarita 230-kV Line (3366b)<br>Applicant/Owner: SDG&E<br>Investigator(s): J. Hodge; G. Scheid | Date: 10-25-00<br>County: Imperial<br>State: CA |
| Do Normal Circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (Atypical Situation)? ☐ Yes ☒ No<br>Is the area a potential Problem Area? ☐ Yes ☒ No<br>(if needed, explain on reverse or attach separate sheet.) | Community ID: Desert Wash<br>Transect ID:<br>Plot ID: 2 |

## VEGETATION

| Dominant Plant Species | Stratum | Indicator | Dominant Plant Species | Stratum | Indicator |
|---|---|---|---|---|---|
| 1. *Pectis papposa* | H | UPL | 9. | | |
| 2. *Psilostrophe cooperi* | H | UPL | 10. | | |
| 3. *Abronia villosa* | H | UPL | 11. | | |
| 4. *Psorothamnus emoryi* | H | UPL | 12. | | |
| 5. | | | 13. | | |
| 6. | | | 14. | | |
| 7. | | | 15. | | |
| 8. | | | 16. | | |

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 0 percent

Remarks:
1. Assume presence of wetland vegetation? ☐ Yes ☒ No
2. Rooted emergent vegetation present? ☐ Yes ☒ No

## HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:
- Depth of Surface Water: N/A (in.)
- Depth to Water in Pit: > 18 (in.)
- Depth to Saturated Soil: > 18 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in: ☐ Upper 12" ☐ 13-18"
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in: ☐ Upper 12" ☐ 13-18"
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☒ Other (Explain in Remarks)

*Observations and Remarks:* Flow lines show in the sediment.

1. *Filamentous or sheet forming algae present?* ☐ *Yes* ☒ *No*
2. *Slope:* ☒ *0-2%; or* ☐ *>2%*
3. *Oxidized rhizospheres:* ☐ *new roots only;* ☐ *old roots only;* ☐ *new and old roots,* ☒ *none*
4. *Flooding:* ☐ *none, flooding not probable;* ☐ *rare, unlikely but possible under unusual weather conditions;* ☒ *occasional, occurs on an average of once or less in 2 years; or* ☐ *frequent, occurs on an average of more than once in 2 years.*
5. *Duration:* ☒ *very brief, if <2 days;* ☐ *brief, if 2-7 days, or* ☐ *long, if >7 days*
6. *Site ponds water?* ☐ *Yes* ☐ *No*

## SOILS

| | |
|---|---|
| Map Unit Name (Series and Phase): Rositas Sand, 0 to 2 percent slopes<br>Taxonomy (Subgroup): Typic Torripsamments | Drainage Class: Somewhat excessively drained<br>Permeability: Rapid<br>Runoff: Slow<br>Field Observations:<br>Confirm Mapped Type? ☒ Yes ☐ No |

Profile Description:

| Depth (inches) | Horizon | Matrix Color (Munsell Moist) | Mottle Colors (Munsell Moist) | Mottle Abundance/ Contrast | Texture, Concretions, Structures, etc. |
|---|---|---|---|---|---|
| 0-18 | | 10YR 6/4 | none | -- | Sand |
| | | | | | |
| | | | | | |

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

*Oberservations and Remarks:*

1. *Smell:* ☐ *Neutral;* ☒ *Slightly fresh; or* ☐ *Freshly plowed field smell*
2. *Site:* ☐ *Irrigated;* ☐ *Land leveled;* ☐ *Ditch drained;* ☐ *Pumped;* ☐ *Graded to drain via slope*
3. *Soils:* ☐ *do* ☒ *do not become frequently ponded or saturated for long (>7 days) to very long durations (>30 days) during the growing season*

## WETLAND DETERMINATION

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | ☐ Yes | ☒ No | Is this Sampling Point within a Wetland? ☐ Yes ☒ No |
| Wetland Hydrology Present? | ☐ Yes | ☒ No | |
| Hydric Soils Present? | ☐ Yes | ☒ No | |

*Remarks:*

1. *Possibly water of the U.S.?* ☒ *Yes* ☐ *No*
2. *Possibly exempt from Corps/EPA Regulation?* ☐ *Yes* ☒ *No (If yes, check item(s) below.)*
   - *(a)* ☐ *Non-tidal drainage and irrigation ditches excavated on dry land*
   - *(b)* ☐ *Artifically irrigated areas which would revert to upland if the irrigation ceased.*
   - *(c)* ☐ *Artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing.*
   - *(d)* ☐ *Artifical reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthic reasons.*
   - *(e)* ☐ *Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States (see 33 CFR 328.3(a)).*

Approved by HQUSACE 3/92

Additional Comments/Remarks:

# APPENDIX D

# Cultural Resource Treatment Plan and Survey Report

**Confidential**

To review, contact:

Joan Oxendine
U.S. Bureau of Land Management
6221 Box Springs Boulevard
Riverside, CA 92507-2497
(909) 697-5365

# APPENDIX E

# North Baja Pipeline Submittal to FERC Regarding Air Quality Impacts

PG&E National Energy Group

North Baja Pipeline

1400 SW Fifth Avenue
Suite 900
Portland, OR 97201

503.833.4000
Fax: 503.833.4900
www.neg.pge.com

FILED
OFFICE OF THE SECRETARY

01 NOV 13 PM 4:13

FEDERAL ENERGY
REGULATORY COMMISSION

November 13, 2001

**INFORMATION HAS BEEN REMOVED FOR PRIVILEGED TREATMENT**

David P. Boergers, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Re: *North Baja Pipeline, LLC*, Docket Nos. CP01-22-000 and CP01-23-000**

Dear Mr. Boergers:

North Baja Pipeline, LLC ("North Baja") hereby submits for filing its Responses to DEIS/DEIR Conditions 10, 11, 15, 17, 18 and 19. North Baja also submits certain supplemental information concerning the East Side Alternative, the Spill Prevention, Containment and Control Plan and Air Quality regarding emissions from Mexican plants.

Certain of the Responses to DEIS/DEIR Conditions contain cultural resources information. Thus, North Baja seeks privileged treatment for such information pursuant to 18 C.F.R. §§ 380.12(f)(4) and 388.112. North Baja encloses a complete original of the filing and seven (7) copies of the filing without the information for which privileged treatment is sought.

If you have any questions regarding this matter, please contact the undersigned.

Sincerely,

Carl M. Fink

**NBP Supplemental Filing**
**November 12, 2001**

**Air Quality Information regarding Emissions from Mexican Power Plants, including:**

1. **NET emissions change in the Mexicali area due to the construction/modification of the power plants associated with NBP**
2. **Total emissions from the two generating units at the Intergen facility that will supply power to Mexico**
3. **Appropriate identification for the two Intergen units that will supply power to Mexico**
4. **Response to American Lung Association Comments from Sempra Energy Affiliate Termoelectrica De Mexicali**

B.5.a.

## Emission impacts in Mexicali/ Imperial Valley

To determine the NET emission change in the Mexicali area we must consider the impacts with and without construction of the N Baja pipeline. The emissions associated with the Sempra and Intergen power plants proposed for the Mexicali area are shown in the table below.

| Emission Source | $NO_x$, TPY | $SO_2$, TPY | Particulate, TPY | CO, TPY | Data Source |
|---|---|---|---|---|---|
| Sempra "Termoelectrica de Mexicali" | 189 | NA | 238 | 188 | 1, 2 |
| Intergen "La Rosita" | 323 | NA | 428 | 1,458 | 3, 4, 5 |
| Intergen "Energia de Baja California" | 1,584 | NA | 428 | 486 | 6, 7 |
| Total | 2,096 | NA | 1,094 | 2,132 | |

Data Sources and notes:

1 $NO_x$ and CO from Imperial County APCD letter to DOE dated September 26, 2001 (Table 1).
2 $PM_{10}$ from Table A-1 of Environmental Assessment (EA) based on emission rate of 12.3 kg/hr used as modeling input for each of two units.
3 $NO_x$ from Table B-2 of EA based on emission rate of 3.1 grams/second used as modeling input for each of three units.
4 CO from Imperial County APCD letter to DOE dated September 26, 2001 (Table 1).
5 $PM_{10}$ determined from Table B-2 of EA based on emission rate of 6.17 grams/second used as modeling input.
6 $NO_x$ and CO from Imperial County APCD letter to DOE dated September 26, 2001 (text of letter states that total Intergen $NO_x$ emissions would be 1,907 TPY for both facilities).
7 $PM_{10}$ estimated based on worse case assumption that emissions would same as La Rosita (see data source 1).
8 No information on $SO_2$ emissions were available. We would expect natural gas-fired emissions to be very low.
9 Information provided by Intergen indicates some differences with the table above, both in total emissions and which emissions come from which plants. Intergen's estimates are:

| Emission Source | NOx, TPY | $SO_2$, TPY | Particulate TPY | CO, TPY |
|---|---|---|---|---|
| "La Rosita" | 1654 | NA | 500 | 1435 |
| "Energia de Baja California" | 131 | NA | 244 | 445 |

If the N Baja pipeline were not constructed, the demand for power would still exist in the Mexicali area and it is reasonable to assume that power plants would be built firing heavy oil or diesel. For the sake of conservatism, we will assume

only one 500 MW, diesel fired combined cycle plant with $H_20$ injection to control NOx, would be built to serve the Mexican load contracted by CFE . (It is highly likely that other plants would also be built since two are already under construction. This is meant only to be a conservative assumption.)

The estimated emissions associated with that single plant would be:

| Emission Source | NOx, TPY | SO2, TPY | Particulate TPY | CO, TPY |
|---|---|---|---|---|
| 500 MW Diesel Combined Cycle | 4100 | 8626 | 205 | 1298 |

These were calculated using EPA's AP-42 emission factors for diesel fired turbines with H2O injection. These factors are: NOx—0.24 lb/mmbtu; CO—0.076 lb/mmbtu; SO2—0.505 lb/mmbtu and PM10—0.012lb/mmbtu. The calculations were also based on an estimated heat rate of 7,800 btu/kwh, an annual heat input of 34,164,000 mmBtu/yr and an assumed diesel fuel sulfur content of 0.5%. (Typical diesel fuel in Mexico tends to be closer to 1%, so this is a conservative assumption.)

Based on these assumptions, the NET emissions impact with the construction of N Baja pipeline in the Imperial County/ Mexicali area would be:

| | NOx, TPY | $SO_2$, TPY | Particulate TPY | CO, TPY |
|---|---|---|---|---|
| Change in total emissions | -2,004 | -8,668 | 889 | 834 |

The reduction in total emissions in the region as a result of the N Baja project would be over 8,900 tons per year.

**Emission Impacts in Rosarito/ Tijuana/ San Diego County**

To look at the impacts of the entire N Baja project, one must also look at what happens in the Rosarito/ Tijuana/ San Diego area. Without the N Baja project, the existing power plants at Rosarito, and the power plants in San Diego, will be subject to increasing curtailments due to inadequate capacity on the SoCal Gas/ SDG&E gas transmission systems. Curtailments of these power plants have already occurred, before several plants at Rosarito had converted from oil only to gas burn capability. As San Diego continues to grow, and as the power plants under development in San Diego come on line and start to consume gas, the situation will get worse. (In fact, the local Air Pollution Control District has testified before the California CPUC in a proceeding on the adequacy of the gas transmission system in San Diego, that they are concerned there will be inadequate pipeline capacity for San Diego even if the North Baja Pipeline is built.)

If one assumes conservatively that only the fuel switching capable plants at Rosarito are curtailed (i.e. existing and future plants in San Diego are not

curtailed, and the new 550 MW combined cycle plant at Rosarito is not curtailed) and that curtailment requiring fuel switching happens only 30% of the time, the following emissions would occur from those plants during the time they were burning oil.

| Emission Source | NOx,TPY | $SO_2$,TPY | Particulate TPY | CO, TPY |
|---|---|---|---|---|
| Rosarito Plant boilers burning oil | 1,575 | 7,889 | 620 | 168 |
| Rosarito Plant CT burning diesel | 2,904 | 1,667 | 40 | 11 |
| Total | 4,479 | 9,556 | 660 | 179 |

With the North Baja pipeline in service, there would be no curtailment to these plants and they would burn gas instead of oil during these periods. The emissions that would occur burning gas are shown in the table below.

| Emission Source | NOx,TPY | SO2,TPY | Particulate TPY | CO, TPY |
|---|---|---|---|---|
| Rosarito Plant boilers burning gas | 940 | 3 | 38 | 416 |
| Rosarito Plant CT burning gas | 1060 | 2 | 22 | 272 |
| Total | 2000 | 5 | 60 | 688 |

These emissions estimates are based on the following Rosarito operating information and assumptions and the following EPA AP-42 boiler and combustion turbine emission factors.

Rosarito Operating Information and Assumptions

| | | |
|---|---|---|
| Boilers | 320 MW | |
| Combustion Turbines(CT) | 180 MW | |
| Fuel Sulfur, % | 1.5 | (This is a conservative estimate. Typical fuel sulfur content in the region is closer to 2.0%.) |
| Boiler Heat Rate, Btu/KWR | 12,000 | Typical of plant built in the 1960's |
| Simple Cycle CT Heat Rate, Btu/kwhr | 14,000 | Typical of simple cycle CT |
| Fuel Oil Heat content, Btu/gallon | 150,000 | Taken from AP-42 |
| Fuel Oil burned in boiler, gallons/year | 67,000,000 | |
| Diesel burned in CT, gallons/year | 44,000,000 | |
| Natural gas burned in boiler, $mmft^3$/year | 9,894 | |
| Natural gas burned in CE, $mmft^3$/yr | 6,493 | |

EPA AP-42 Factors used for analysis

| Pollutant | AP-42 Boiler Emission Factors | | AP-42 Combustion Turbine Emission Factors | |
|---|---|---|---|---|
| | Fuel oil, lb/1000 gal | Natural Gas, $lb/mmft^3$ | Diesel, lb/mmBtu | Natural Gas, lb/mmBtu |
| $NO_x$ | 47.0 | 190 | 0.88 | 0.32 |
| CO | 5.0 | 84 | 0.0033 | 0.082 |
| $SO_2$ | 235.S | 0.6 | 0.505 | 0.0006 |
| $PM_{10}$ | 18.5 | 7.6 | 0.012 | 0.0066 |

The Net Impact in the Rosarito/ Tijuana/ San Diego region would be:

| | NOx, TPY | $SO_2$, TPY | Particulate, TPY | CO, TPY |
|---|---|---|---|---|
| Change in total emissions | -2479 | -9551 | -600 | 509 |

The reduction in total tons of emissions in this region as a result of the N Baja project would be over 12,000 tons per year.

**Total North Baja emission impacts**

The overall combined impact in the San Diego/ Rosarito/ Imperial Valley/ Mexicali trans-border region with construction of the N Baja pipeline would be:

| | NOx, TPY | $SO_2$, TPY | Particulate TPY | CO, TPY |
|---|---|---|---|---|
| Change in total emissions | -4,483 | -18,177 | 289 | 1,342 |

The total reduction in emissions in the entire trans border region from the North Baja project would be over 21,000 tons per year.

*B.5.b.*

Refer to the emissions in the table above.

*B.5.c.*

The original Intergen project, known as Energia Azteca X or "La Rosita", was a 750 MW facility with 500 MW dedicated to serving CFE and 250 MW for export. Intergen later added a new 250 MW project for export at the same site that is known as Energia de Baja California. Energia de Mexicali was a proposed project that never signed a Precedent Agreement with North Baja, and to our knowledge has ceased development efforts.

Termoeléctrica De Mexicali

Octávio Simões
Director

101 Ash St.
San Diego, CA 92101-3017

Tel: 619.696.2287
Fax: 619.696.2911
Cellular: 619.540.5345
osimoes@sempra-res.com



October 16, 2001

Ms. Jan Cortez, Vice President, Research and Environmental Health
Ms. Susanna Concha Garcia, Environmental Health Coordinator
American Lung Association of San Diego and Imperial Counties
2750 Fourth Avenue
San Diego, CA 92103

Dear Jan and Susanna:

We would like to thank you for the opportunity afforded to us on September 28th to meet. The primary purpose of this meeting was to address the concerns of the American Lung Association ('ALA') and clear up misinformation regarding Sempra Energy's power plant project in Mexicali. One of the action items we had from this meeting was to provide a written response to the letter sent by ALA to Presidents Bush and Fox on September 5, 2001.
In the referenced letter, nine points are presented regarding the direction that the ALA would like to see taken when power plants are developed in the border region. As a sponsor of one of the new power plants being developed in the region, specifically, the 600 MW Termoeléctrica De Mexicali ('TDM') project in Mexicali, we would like to address those nine points.

1. ***That all new power plants built along the Mexico-USA border should meet simultaneously with Mexican and US air emission standards for $NO_x$, CO, VOCs, $SO_{2,}$, $PM_{10}$ and ammonia.***

TDM is voluntarily complying with this requirement. TDM is not only meeting all the Mexican law requirements, but also installing the exact same equipment being required of plants that have been most recently licensed in California and Arizona. Specifically, dry low NOx combustors and Selective Catalytic Reduction for $NO_x$ control to a level of 2.5 ppm @15% $O_2$ and oxidizing catalyst for CO control to a level of 4 ppm @15% $O_2$. All other levels of emissions for the TDM project are the same as those most recently permitted projects in the United States.

2. ***Install continuous emission monitors and share the data with authorities on both sides of the border on a regular basis.***

TDM is voluntarily complying with this requirement. In May of 2001, TDM sent the Imperial County Board of Supervisors a written proposal wherein TDM committed to install and operate continuous emission monitors at the power plant, share the data with the Imperial County Air Pollution Control District ('ICAPCD'), and allow access to the plant by officials of Imperial County. We are disappointed that we have not received any feedback from the Imperial Valley

on that proposal to date. That notwithstanding, we will proceed with the installation, operation and sharing of this information with interested parties.

3. ***That air pollution offsets be required to match the new pollution generated from power plants on a ton for ton basis.***

The Mexican government, like many others around the world, does not recognize the emission offsets concept. Furthermore, even in the United States, not all air contaminants are required to be "offset". Only those pollutants that are considered to be in non-attainment or are precursors to non-attainment air contaminants are required to be offset. For example, CO emissions are rarely required to be offset (this is the case even in many areas considered to be in non-attainment for CO). The position adopted by TDM from the beginning was to build the cleanest plant possible instead of building a plant that complied solely with Mexican law and mitigate the higher emissions with offsets. Additionally, TDM has discussed this issue with the ICAPCD. During those conversations, it was clear that their preference was to build the cleanest plant possible. This approach is significantly more expensive to the project when compared to not installing additional emission controls, meeting Mexican regulatory requirements only, and seeking emission offsets from Mexican sources for the higher emission rate. It is also interesting to note that one of TDM's affiliate companies is the owner of the gas distribution company in Mexicali - ECOGAS. Based on the actual conversion of existing customers from fuel and diesel oil to natural gas, we have calculated the reductions in emissions achieved from the conversions to natural gas of ECOGAS customers. The results show annual estimated reductions in excess of 250 tons of $NO_x$, 75 tons of $PM_{10}$, and 2,450 tons of $SO_2$. These NOx and $PM_{10}$ and $PM_{10}$ precursor reductions would be more than enough to "offset" TDM's emissions. The calculation is attached for your reference.

4. ***To fund Sustainable Development Projects as mitigation for air pollution generated by power plants.***

TDM is building a US $20 million water treatment plant to help Mexicali deal with a critical environmental problem. The existing sewage treatment plant cannot handle Mexicali's sewage treatment needs, which results in sewage being discharged to local water bodies. Furthermore, the existing sewage treatment facility provides primary treatment before discharging. TDM's sewage treatment facility will provide secondary and tertiary water treatment to the water that will be used by the project. TDM has also sought proposals from the Imperial County Board of Supervisors to address projects that can benefit the environment in Imperial County. This approach is consistent with the approach that our company takes when developing generation anywhere in the world.

5. ***Air-monitoring stations located in Mexicali and Calexico should be fully functional.***

TDM agrees that ensuring fully functional air monitoring stations is very important in providing documentation of existing air quality and future changes to air quality. However, the responsibility for ensuring that the stations are functional lies with the pertinent country agencies and is not a function that can be undertaken by individual entities.

***6. That power plant companies put in writing that they will burn only natural gas, unless an emergency condition occurs.***

TDM is voluntarily complying with this requirement. TDM is designed and being built to burn only gas. TDM's permit application states that it will burn natural gas only.

***7. Mexico to adopt new regulations for the border area to require facilities to employ the best available control technology for air emissions.***

TDM is voluntarily complying with this requirement. Whether Mexico adopts this requirement or not is an issue that TDM has no control over; however, if Mexico were to adopt this requirement, no modifications would be required at TDM.

***8. California to create legislation that requires all power plants exporting electricity to the state to meet California Air Quality Emission Standards for air emissions.***

TDM is voluntarily complying with this requirement. Whether California adopts this requirement or not is an issue that TDM has no control over; however, if California were to adopt this requirement, no modifications would be required at TDM.
For clarification, we assume that the ALA is proposing to impose this requirement on all the plants exporting power to California, whether they are located in Mexico, Canada, or any of the neighboring states.

***9. Both countries to support alternative methods of energy production, reduce energy demand, and support efficient use of energy.***

We agree. TDM and its affiliated companies have one of the strongest records in supporting these principles. At our El Dorado Energy facility, Sempra Energy Resources owns approximately 200 kw of solar powered electrical generation facilities. We are continually evaluating other alternative methods of energy production and retain an open mind to their use.

As documented above, we share your concerns and have implemented the TDM project in a way that meets all the points suggested in the ALA letter, especially those that TDM can address directly. We believe that TDM is leading the way as a model for the environmentally responsible development of power plants in the border region. Since TDM is meeting all the ALA requirements, we would like to take this opportunity to ask for your public support of our project.

During our meeting, we also discussed the North Baja pipeline that is being developed by one of our affiliates. The pipeline will bring natural gas to Baja California and to San Diego. This is the first major source of clean fuel supply to the region in years. As the regional economy continues to grow, the demand for energy will increase. If natural gas is not available, the alternative is likely to be oil, especially in Mexico. Supporting the pipeline development will yield a significant improvement in air quality to both Mexico and the United States, as the emissions from oil will be significantly higher than emissions from gas. We have also included a calculation that

illustrates this point. Given the tangible benefits to air quality for the region, we would also like to request that the ALA consider publicly supporting the execution of the pipeline project.

Please call us if you have any questions or comments. Thank you,

Very truly yours,

Octavio Simões, Director

cc:
M. Nelson
K. Prasser

# YEAR 2000

## CALCULATION OF EMISSION REDUCTIONS IN MEXICALI ACHIEVED BY SEMPRA ENERGY

# Actual Emission Reductions in Mexicali Resulting from Sempra Energy Natural Gas Sales in Year 2000

## Background

- Sempra Energy's local natural gas distribution company in Mexicali, ECOGAS, has approximately 11,700 residential and industrial customers.
  - Approximately 140 of these are commercial customers.
- Prior to ECOGAS's existance, all current ECOGAS customers used either propane, fuel oil #6 or fuel oil #2.
  - Residential customers used propane.
  - Industrial customers used propane, fuel oil #6 and, to a lesser extent, fuel oil #2.
  - Industrial customers include Sidek, a steel manufacturing facility; San Francisco, a paper mill; Fabrica de Envases de Vidrio, a glass manufacturing facility; VITRO, also a glass manufacturing facility; Zahary, an asphalt roof shingle manufacturer, and others.
  - The fuel consuming equipment at these sources consists of external combustion sources such as boilers and combustion ovens.
- In the year 2000, Ecogas supplied a total of 3,977,456 MMBtu of natural gas in Mexicali.
  - 69,440 MMBtu was consumed by residential customers.
  - 3,908,016 MMBtu was consumed by industrial sources.
    - 1,406,886 MMBtu was consumed by industrial sources previously utilizing propane.
    - 2,501,130 MMBtu was consumed by industrial sources previously utilizing fuel oil #6 and fuel oil #2.
      - 2,346,810 MMBtu displaced fuel oil #6 usage
      - 154,320 MMBtu displaced diesel oil #2 usage

**2000 Mexicali Natural Gas Sales by Sector and Fuel Displaced**

| | | Fuel Displaced | MMBtu |
|---|---|---|---|
| 1 | Total natural gas usage – Mexicali | Propane, fuel oil #6 and fuel oil #2 | 3,977,456 |
| 2 | Residential customers | Propane | 69,440 |
| 3 | Industrial customers | Propane, fuel oil #6 and fuel oil #2. | 3,908,016 |
| 4 | Industrials firing fuel oil | Fuel oil #6 and fuel oil #2 | 2,501,130 |
| 5 | Industrials firing fuel oil #6 | Fuel oil #6 | 2,346,810 |
| 6 | Industrials firing fuel oil #2 | Fuel oil #2 | 154,320 |

## YEAR 2000 EMISSIONS REDUCED IN MEXICALI BY SEMPRA ENERGY NATURAL GAS SALES

Based on the numbers above and the assumptions detailed below, the amount of emissions reduced as a result of the year 2000 sales of natural gas in Mexicali by Sempra Energy can be calculated.

Given:

- 2,346,810 MMBtu of fuel oil #6 usage from industrial sources was displaced in 2000.
- 154,320 MMBtu of fuel oil #2 usage from industrial sources was displaced in 2000.

Assumptions:

- EPA AP-42 emission factors are applicable.
- All of the fuel oil displaced was consumed by external combustion sources, consisting of boilers < 100 MMBtu/hr of heat input.
- Emission factors for fuel oil are from AP-42, Chapter 1.3 – Fuel Oil Combustion, Table 1.3-1.
  - ⇨ Fuel oil #6:
    AP-42 emission factors:
    - NOx – 55 lb/1000 gal
    - PM – 10 lb/1000 gal
    - $SO_2$ – 157S lb/1000 gal
  - ⇨ Fuel Oil #2
    AP-42 emission factors
    - NOx – 20 lb/1000 gal
    - PM – 2 lb/1000 gal
    - $SO_2$ – 142S lb/1000 gal
- Emission factors for natural gas are from AP-42, Chapter 1.4 – Natural Gas Combustion, Table 1.4-1 and Table 1.4-2; note that sulfur content is unspecified in AP-42, therefore, assume 2000 grains/MMcf.
  - ⇨ Natural Gas
    AP-42 emission factors
    - NOx – 100 lb/MMcf
    - PM – 1.9 lb/MMcf
    - $SO_2$ – 2000 grains/MMcf
- Fuel oil #6 heating content = 150 MMBtu/1000 gal (see AP-42, page 1.3-8)
- Fuel oil #2 heating content = 140 MMBtu/1000 gal (see AP-42, page 1.3-8)
- Fuel oil #6 sulfur content = 2% by weight
- Fuel oil #2 sulfur content = 0.05% by weight
- Assume natural gas heating content of 1035 Btu/cf

Calculations:

1. Convert natural gas consumed to liquid fuel equivalent on a BTU basis:

   Fuel oil #6: (2,346,810 MMBtu)(1/150 MMBtu/1000 gal) = 15,645,400 gallons

   Fuel oil #2: (154,320 MMBtu)(1/140 MMBtu/1000 gal) = 1,102,286 gallons

   This represents the amount of fuel oil displaced by natural gas sales.

2. Calculate the amount of emissions that would have been generated in 2000 if natural gas sales had been in liquid fuel form:

   Fuel Oil #6:

   | | | |
   |---|---|---|
   | NOx: | (55 lb/1000 gal)(15,645,400 gallons) = | 860,497 lb NOx |
   | PM: | (10 lb/1000 gal)(15,645,400 gallons) = | 156,454 lb PM |
   | $SO_2$: | (157 lb/1000gal)(2)(15,645,400 gallons) = | 4,912,656 lb $SO_2$ |

   Fuel Oil #2:

   | | | |
   |---|---|---|
   | NOx: | (20 lb/1000 gal)(1,102,286 gallons) = | 22,046 lb NOx |
   | PM: | (2 lb/1000 gal)(1,102,286 gallons) = | 2,205 lb PM |
   | $SO_2$: | (142 lb/1000 gal)(0.05)(1,102,286 gallons) = | 7,828 lb $SO_2$ |

   Total Displaced Fuel Oil Emissions Avoided in 2000 by Natural Gas Sales:

   | | Fuel Oil #6 (lb) | Fuel Oil #2 (lb) | Total (lb) | Total Fuel Oil Fired Emissions (TPY) |
   |---|---|---|---|---|
   | NOx: | 860,497 | 22,046 | 882,543 | 441 |
   | PM: | 156,454 | 2,202 | 158,656 | 79 |
   | $SO_2$: | 4,912,656 | 7,828 | 4,920,482 | 2,460 |
   | Totals: | 5,929,607 | 32,074 | 5,961,681 | 2,981 |

3. In order to calculate NET emissions displaced, the amount of natural gas emissions have to calculated:

   Convert the amount of MMBtu's of natural gas consumed to cubic feet:

   - As noted, 3,908,016 MMBtu was consumed by industrial sources, assuming 1035 Btu/cf:

     (3,908,016 MMBtu)(1/1035 Btu/cf) = 3,776 MMcf in 2000

4. Calculate amount of emissions generated by natural gas fuel usage in 2000:

   | | | |
   |---|---|---|
   | NOx: | (100 lb/MMcf)(3776 MMcf) = | 377,600 lb NOx |
   | PM: | (1.9 lb/MMcf)(3776 MMcf) = | 7,174 lb PM |
   | $SO_2$: | (2000 gr/MMcf)(1 lb/7000 gr)(3776 MMcf) = | 1,079 lb $SO_2$ |

Total Natural Gas Fired Emissions in 2000:

| | Total Natural Gas Fired Emissions (lb) | Total Natural Gas Fired Emissions (TPY) |
|---|---|---|
| NOx: | 377,600 | 189 |
| PM: | 7,174 | 4 |
| $SO_2$: | 1,079 | 0.5 |

5. Net emissions reduction, therefore, is the difference between the displaced fuel oil emissions (item 2) and the natural gas fired emissions (item 4) above:

**YEAR 2000 NET EMISSION REDUCTIONS DUE TO NATURAL GAS SALES IN MEXICALI BY SEMPRA ENERGY**

| | Oil Fired Emissions (TPY) | Natural Gas Fired Emissions (TPY) | Net Emissions Reduction (TPY) |
|---|---|---|---|
| NOx: | 441 | 189 | 252 |
| PM: | 79 | 4 | 75 |
| $SO_2$: | 2460 | 0.5 | 2460 |
| Total: | 2980 | 194 | 2787 |

**CONCLUSIONS**

- Sempra Energy's natural gas distribution company in Mexicali, ECOGAS, supplies natural gas to residential and industrial customers in Mexicali.
- In the Year 2000, ECOGAS sold 3,977,456 MMBtu's of natural gas in Mexicali.
- Sempra Energy's natural gas sales in Mexicali resulted in the displacement of 2,885,913 of fuel oil usage in Mexicali from industrial sources.
- This displacement of fuel oil usage has resulted in a net reduction of 2785 tons of total emissions in the year 2000, consisting of 252 tons of NOx, an ozone precursor, 75 tons of PM and 2458 tons of $SO_2$, a PM precursor.

# CALCULATION OF EMISSION REDUCTIONS IN BAJA CALIFORNIA NATURAL GAS PIPELINE VS. FEASIBLE ALTERNATIVES

# COMPARISON OF NATURAL GAS AND OIL FIRED EMISSIONS

Assumptions

- EPA AP-42 emission factors are applicable.
- All of the fuel oil and natural gas is consumed by external combustion sources, consisting of boilers < 100 MMBtu/hr of heat input.
- Emission factors for fuel oil are from AP-42, Chapter 1.3 – Fuel Oil Combustion, Table 1.3-1.
  - Fuel oil #6:

    AP-42 emission factors:
    - NOx – 55 lb/1000 gal
    - PM – 10 lb/1000 gal
    - $SO_2$ – 157S lb/1000 gal

  - Fuel Oil #2

    AP-42 emission factors
    - NOx – 20 lb/1000 gal
    - PM – 2 lb/1000 gal
    - $SO_2$ – 142S lb/1000 gal
- Emission factors for natural gas are from AP-42, Chapter 1.4 – Natural Gas Combustion, Table 1.4-1 and Table 1.4-2; note that sulfur content is unspecified in AP-42, therefore, assume 2000 grains/MMcf.
  - Natural Gas

    AP-42 emission factors
    - NOx – 100 lb/MMcf
    - PM – 1.9 lb/MMcf
    - $SO_2$ – 2000 grains/MMcf
- Fuel oil #6 heating content = 150 MMBtu/1000 gal (see AP-42, page 1.3-8)
- Fuel oil #2 heating content = 140 MMBtu/1000 gal (see AP-42, page 1.3-8)
- Natural gas heating content = 1035 Btu/cf
- Fuel oil #6 sulfur content = 2% by weight
- Fuel oil #2 sulfur content = 0.05% by weight

Convert Emission Factors to Energy Basis

Natural Gas

| | | |
|---|---|---|
| NOx: | (100 lb/MMcf)(1/1035 Btu/cf) = | 0.0966 lb NOx/MMBtu |
| PM: | (1.9 lb/MMcf)(1/1035 Btu/cf) = | 0.0018 lb PM/MMBtu |
| $SO_2$: | (2000 gr/MMcf)(1 lb/7000 gr)(1/1035 Btu/cf) = | 0.0003 lb $SO_2$/MMBtu |

Fuel Oil #6

| | | |
|---|---|---|
| NOx: | (55 lb/1000 gal)(1/150 MMBtu/1000 gal) = | 0.3667 lb NOx/MMBtu |
| PM: | (10 lb/1000 gal)(1/150 MMBtu/1000 gal) = | 0.0066 lb PM/MMBtu |
| $SO_2$: | (157 lb/1000gal)(2)(1/150 MMBtu/1000 gal) = | 2.0933 lb $SO_2$/MMBtu |

Fuel Oil #2

| | | |
|---|---|---|
| NOx: | (20 lb/1000 gal)(1/140 MMBtu/1000 gal) = | 0.1429 lb NOx/MMBtu |
| PM: | (2 lb/1000 gal)(1/140 MMBtu/1000 gal) = | 0.0143 lb PM/MMBtu |
| $SO_2$ | (142 lb/1000 gal)(0.05)(1/140 MMBtu/1000 gal) = | 0.0507 lb $SO_2$/MMBtu |

Calculate Mexicali Weighted Basis Oil Emission Factor:

- Assume 50% of new fuel oil usage would utilize fuel oil #6 and 50% would utilize fuel oil #2, instead of historical ratios of 95% fuel oil #6 to 5% fuel oil #2:

| | | |
|---|---|---|
| NOx: | (0.50)(0.3667) + (0.50)(0.1429) | 0.2548 lb NOx/MMBtu |
| PM: | (0.50)(0.0066) + (0.50)(0.0143) | 0.0105 lb PM/MMBtu |
| $SO_2$: | (0.50)(2.0933) + (0.50)(0.0507) | 1.0720 lb $SO_2$/MMBtu |

Calculate Difference in Emissions Natural Gas Fired vs. Fuel Oil Fired

| | Natural Gas | Fuel Oil | Difference |
|---|---|---|---|
| NOx: | 0.0966 lb NOx/MMBtu | 0.2548 lb NOx/MMBtu | 2.64 |
| PM: | 0.0018 lb PM/MMBtu | 0.0105 lb PM/MMBtu | 6 |
| $SO_2$: | 0.0003 lb $SO_2$/MMBtu | 1.0720 lb SO2/MMBtu | 3573 |

Thus, assuming 50% fuel oil #6 firing and 50% fuel oil #2, fuel oil produces 2.6 times more NOx, 6 times more PM and 3500 time more SO2 emissions than natural gas.

## Convert Emission Factors to Energy Basis

Natural Gas

| | | |
|---|---|---|
| NOx: | (100 lb/MMcf)(1/1035 Btu/cf) = | 0.0966 lb NOx/MMBtu |
| PM: | (1.9 lb/MMcf)(1/1035 Btu/cf) = | 0.0018 lb PM/MMBtu |
| $SO_2$: | (2000 gr/MMcf)(1 lb/7000 gr)(1/1035 Btu/cf) = | 0.0003 lb $SO_2$/MMBtu |

Fuel Oil #6

| | | |
|---|---|---|
| NOx: | (55 lb/1000 gal)(1/150 MMBtu/1000 gal) = | 0.3667 lb NOx/MMBtu |
| PM: | (10 lb/1000 gal)(1/150 MMBtu/1000 gal) = | 0.0066 lb PM/MMBtu |
| $SO_2$: | (157 lb/1000gal)(2)(1/150 MMBtu/1000 gal) = | 2.0933 lb $SO_2$/MMBtu |

Fuel Oil #2

| | | |
|---|---|---|
| NOx: | (20 lb/1000 gal)(1/140 MMBtu/1000 gal) = | 0.1429 lb NOx/MMBtu |
| PM: | (2 lb/1000 gal)(1/140 MMBtu/1000 gal) = | 0.0143 lb PM/MMBtu |
| $SO_2$ | (142 lb/1000 gal)(0.05)(1/140 MMBtu/1000 gal) = | 0.0507 lb $SO_2$/MMBtu |

## Calculate Mexicali Weighted Basis Oil Emission Factor

- Assume 50% of new fuel oil usage would utilize fuel oil #6 and 50% would utilize fuel oil #2, instead of historical ratios of 95% fuel oil #6 to 5% fuel oil #2:

| | | |
|---|---|---|
| NOx: | (0.50)(0.3667) + (0.50)(0.1429) | 0.2548 lb NOx/MMBtu |
| PM: | (0.50)(0.0066) + (0.50)(0.0143) | 0.0105 lb PM/MMBtu |
| $SO_2$: | (0.50)(2.0933) + (0.50)(0.0507) | 1.0720 lb $SO_2$/MMBtu |

## Calculate Difference in Emissions Natural Gas Fired vs. Fuel Oil Fired

| | Natural Gas | Fuel Oil | Difference |
|---|---|---|---|
| NOx: | 0.0966 lb NOx/MMBtu | 0.2548 lb NOx/MMBtu | 2.64 |
| PM: | 0.0018 lb PM/MMBtu | 0.0105 lb PM/MMBtu | 6 |
| $SO_2$: | 0.0003 lb $SO_2$/MMBtu | 1.0720 lb SO2/MMBtu | 3573 |

Thus, assuming 50% fuel oil #6 firing and 50% fuel oil #2, fuel oil produces 2.6 times more NOx, 6 times more PM and 3500 time more SO2 emissions than natural gas.

# APPENDIX F

# North Baja Pipeline Submittal to FERC Regarding Natural Gas Demand

PG&E National Energy Group
North Baja Pipeline

1400 SW Fifth Avenue
Suite 900
Portland, OR 97201

503.833.4000
Fax: 503.833.4900
www.nbpg.pge.com

FILED
OFFICE OF THE SECRETARY
01 NOV 13 PM 4:13
FEDERAL ENERGY
REGULATORY COMMISSION

November 13, 2001

**INFORMATION HAS BEEN REMOVED FOR PRIVILEGED TREATMENT**

David P. Boergers, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Re: *North Baja Pipeline, LLC*, Docket Nos. CP01-22-000 and CP01-23-000**

Dear Mr. Boergers:

North Baja Pipeline, LLC ("North Baja") hereby submits for filing its Responses to DEIS/DEIR Conditions 10, 11, 15, 17, 18 and 19. North Baja also submits certain supplemental information concerning the East Side Alternative, the Spill Prevention, Containment and Control Plan and Air Quality regarding emissions from Mexican plants.

Certain of the Responses to DEIS/DEIR Conditions contain cultural resources information. Thus, North Baja seeks privileged treatment for such information pursuant to 18 C.F.R. §§ 380.12(f)(4) and 388.112. North Baja encloses a complete original of the filing and seven (7) copies of the filing without the information for which privileged treatment is sought.

If you have any questions regarding this matter, please contact the undersigned.

Sincerely,

Carl M. Fink

**and economic development projects that can be constructed and operated including the potential long term air quality deterioration and human health impacts on Imperial and Mexicali Valley residents.**

Mexicali is one of the fastest growing regions in Mexico. This growth will continue to occur with or without the installation of NBP.

Until the local LDC in Mexicali was developed in the 1990's, all fuel use for commercial and industrial purposes in Mexicali was either #6 fuel oil or #2 diesel, both of which are readily available. When the LDC was established in Mexicali, a limited number of existing commercial and industrial facilities converted from liquid fuels to natural gas. It is estimated by the owner of the LDC that the emission reductions in 2000 from those conversions from oil to gas was over 250 tons of $NO_x$, 75 tons of PM, and 2400 tons of $SO_2$ (a PM precursor). LDC is rapidly approaching its capacity to receive natural gas from the Southern California Gas Company pipeline that supplies it. When that capacity is reached, and if NBP is not built, all future industrial and commercial development will require the use of #2 or #6 fuel oils. If that mix were on a 50%/50% basis, then $NO_x$ emissions would be 2.6 times more than they would on natural gas, PM emissions would be 6 times more than they would be on natural gas, and $SO_2$ emissions would be 3500 times more than they would be on natural gas.

Clearly, the "worst case scenario" is the one where NBP is not built.

**Comment 12 c): The County states: "The stated purpose of the natural gas pipeline is to build a number of new power plants, and "<u>but for</u>" these power plants, there would be no gas pipeline proposed at this time."**

The stated purpose of the Proposed Project "is to serve *existing* and incremental electric power generation, local distribution company (LDC), and other market loads in two specific locations along the California/Western Arizona and Mexico border:

1. in the Tijuana and Rosarito, Baja California, Mexico area, south of San Diego, California; and

2. in the Mexicali, Mexico area, south of El Centro, California." (NBP Application, Resource Report 1, p. 1-3)

NBP has signed contracts with shippers to supply over half of the pipeline capacity to existing facilities or a new power plant (Otay Mesa) that are not in the Mexicali region. In addition, it has a contract to supply gas to the LDC in the Mexicali region. These contracts alone are sufficient to justify construction of the pipeline. There is no "but for" connection between the pipeline and these two power plants.

It is also important to point out that while Imperial County is concerned about potential air quality impacts of facilities served by NBP, San Diego County is strongly in support of NBP. This is because NBP will allow for full fuel switching from oil to gas at the Presidente Juarez

facility in Rosarito, and will effectively eliminate the constraint on pipeline capacity serving San Diego and reduce significantly the potential for curtailment of gas supply in San Diego, which causes the power plants in the county to have to burn oil.

**Comment 12(d): The county comments that criteria pollution, e.g. PM10 and ozone, transport due to heavy industrial, commercial and economic development projects resulting from the new power plants could occur.**

While it is reasonable to assume that development will occur near the new power plants, it is very difficult to predict the impact on air quality that these sources may or may not have in Imperial County. It is clear, however, that if NBP is not built, any development in Mexicali will need to be fueled by liquid fuels with significantly higher emissions impacts than if they were fueled by natural gas.

**Comment 13: Un-addressed Project Alternatives**

The power plants that are being built to take gas from NBP and GB in Mexico will be state of the art and among the most fuel efficient in the west. As a result they are unlikely to be closed as a result of economic changes in the power industry because they will be able to produce some of the cheapest power available in the area. Also, no one is projecting any sustained reduction in electric demand in either California or North Baja in Mexico.

**Comment 14: The County comments that "The environmental document needs to identify and address offsets for air pollution, growth-inducement in the Mexican Valley, such as explanation of businesses and residential and other uses, as well as other impacts identified in the Draft EIS/EIR caused both directly and indirectly (secondary impacts) by the project.**

The draft EIS/DEIR addresses cumulative impacts at the appropriate level of detail. Response to comment 28(c) pertaining to comments of the Imperial County Planning Department shows that the pipeline provides access to natural gas and displaces more polluting fuels.

**Comment 15: Need to identify and designate where Imperial County and all other applicable jurisdiction/agencies will have control over the remediation of offsets and recourse to the project impacts, and identify all laws and permitting processes**

Table 1.7-1 of the draft EIS/EIR lists major permits, approvals and consultations that govern the design, construction and operation of the North Baja pipeline.

# APPENDIX G

# Applicants' Submittals Regarding Possible Alternate Fuel Supply

**BAJA CALIFORNIA POWER, INC.**
2 Alhambra Plaza, Suite 1100
Coral Gables, FL 33134
Tel: (305) 461-6950
Fax: (305) 461-6977

November 28, 2001

Tony Como
Deputy Director, Electric Power Regulation
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Re: Alternative Fuel Sources for power generation facilities supplying power to Baja California Power, Inc.

Dear Tony:

As you are aware, the La Rosita Power Complex (LRPC) will generate approximately 1060 MW of power, approximately 560 MW of which will be exported to the U.S. The remaining 500 MW are under contract to the Comisión Federal de Electricidad (CFE), Mexico's National electric utility. The LRPC, which includes the turbines that will generate power for Mexico's domestic consumption and for export, is planning on receiving natural gas from the North Baja Pipeline. Baja California Power is a special purpose company that will transmit the power that will be exported from Mexico to the US.

The LRPC has looked at alternatives to supplying natural gas to the generation facilities in case the North Baja Pipeline is not available, and the purpose of this letter is to explain these alternatives. While supply of clean burning natural gas through the North Baja Pipeline remains our preferred choice of fuel supply, the three main available alternatives that we have considered are: 1) supply through Southern California Gas' (SoCal Gas) system in Imperial County, California, 2) back-hauling supply through Sempra's Transportadora de Gas Natural (TGN) and Gasoducto Bajanorte (GBN) systems in Mexico, and 3) equipping the generation facilities to process diesel, and obtaining diesel supply from Pemex, Mexico's national oil company.

1) Supply through SoCal Gas System. SoCal gas currently supplies gas to Mexicali's local gas distribution company. This system terminates approximately 20 miles from the LRPC. SoCal's existing system would have to be expanded to allow the transportation of the natural gas volumes needed for power generation. While we have studied this option and believe that this expansion is technically feasible, any modification to the SoCal gas system would require approval from the California Public Utilities Commission (CPUC). The approval process would be lengthy,

thereby resulting in a delay in the delivery of power from the LRPC to Mexico and California.

2) Back-hauling supply through TGN and GBN. This option would obtain the gas supply from San Diego Gas & Electric's (SDG&E) system in San Diego, transport it first through Sempra's TGN pipeline to Rosarito, Baja California, then through Sempra's GBN pipeline to Mexicali. Our review indicated that this option also is technically feasible, but would be more costly than NBP as it would require the upgrade of the TGN system. Worth noting is that during the summer and fall of 2000, the San Diego area suffered from gas supply curtailments due to lack of capacity upstream. Thus, if the LRPC were to avail itself of this alternative, the LRPC would run the risk of having its gas supply curtailed. This would also affect the delivery of power to CFE, the Mexican national electric company. As an alternative, gas could be obtained from the proposed new LNG terminal near Ensenada, Baja California, and back-hauled over GBN.

3) Liquid fuels. The combustion turbines at the LRPC can be retrofitted to burn diesel fuel. Pemex has a liquid fuels terminal in Mexicali, located approximately 5 km from the LRPC, which would facilitate the delivery of diesel. For this option, the generation facilities would have to be modified to accept diesel fuel and the diesel handling facilities installed. Our review indicated that these modifications would delay commercial operation of the LRPC beyond the California peak demand period in 2003, as well as delaying delivery of power to Mexico. In addition, this option is disfavored by the LRPC, as emissions from diesel-fired generation would be substantially higher than when combusting natural gas.

The options mentioned above are not the optimal choice for delivering timely, environmentally sound and inexpensive power to both Mexico and the United States. Nevertheless, Energia Azteca X (EAX) and Energía de Baja California (EBC), which together make-up the LRPC, have commenced construction of the power generation facilities and will find alternate fuel supply if the NBP is not available within the time periods necessary. As of October 2001, EAX and EBC have jointly spent or committed to spending approximately $600 million out of a total of $765 million.

We appreciate the diligent work of the Department of Energy in processing the Presidential permit application for the Baja California Power transmission line, which will make power available to California as early as summer of 2002. If you require any additional information, please do not hesitate to call me at (305) 461-6945. Thank you.

Yours very truly,

Orlando Martinez

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November 26, 2001

Anthony Como
U.S. Department of Energy
Office of Fossil Energy, FE-27
1000 Independence Avenue, S.W.
Washington, DC 20485

Dear Mr. Como:

The DOE has requested information pertaining to Sempra Energy Resource's intent to construct or not construct Termoeléctrica de Mexicali (TDM) if the North Baja Pipeline (NBP) is not approved and constructed. In summary, Termoeléctrica de Mexicali will be constructed regardless of whether or not the US portion of NBP is constructed. Below is a discussion regarding this matter.

***Background on natural gas supply***

There are currently two natural gas interconnections into Baja California. The first is located at San Diego/Tijuana and connects the San Diego Gas & Electric (SDG&E) system to the Transportadora de Gas Natural (TGN) system in Mexico. The second is located at El Centro/Mexicali and connects the Southern California Gas Company (SCG) system to the Distribuidora de Gas Natural (DGN) system in Mexico.

NBP is a joint venture between PG&E National Energy Group, and Sempra Energy International. PG&E is developing the US portion of NBP, while Sempra Energy International is developing the Mexican portion of the pipeline. NBP will bring natural gas from the United States and supply the DGN and TGN systems as well as new customers in Baja California and the United States. The Mexican portion of the pipeline has received all of its Mexican regulatory approvals and is already under construction. The Mexican portion of the pipeline will be completed in July 2002.

***Fuel supply to TDM***

Sempra Energy has all regulatory approvals to construct and operate TDM in Mexico and has already initiated construction of the power plant.

TDM has entered into a 20-year contractual agreement with NBP for fuel transportation rights on the North Baja pipeline. This fuel source is the cleanest, most economical, and provides the most efficient fuel source available to the TDM project.

Sempra Energy has entered into an electricity supply contract with the California Department of Water Resources (CDWR). TDM is an important part of the portfolio of assets that will supply the power required under the CDWR contract.

TDM has made well over $280 million in construction contractual commitments of which $120 million has been paid to date. Total construction cancellation costs for TDM are currently estimated to be $200 million. It may not be financially prudent to cancel the project given the sunk costs that would occur if it were cancelled at this point in time. In order to recover these investments, should the US portion of the North Baja pipeline not be constructed, various fuel alternatives have been explored as contingency.

If the U.S. portion of the pipeline is not built, and TDM is forced to fuel the plant from alternative sources, TDM would seek to obtain fuel supplies from other sources that may be available. Possible sources would include existing connections to the United States at the border with Mexico and the future LNG facility proposed recently by Sempra Energy. Natural gas from either of these sources would flow to TDM via the Mexican portion of the pipeline.

***Conclusion***

Sempra Energy remains committed to the TDM project and to satisfy the contractual obligations to supply power to the state of California. The preferred and most economical fuel supply to TDM is through the North Baja Pipeline; however, if NBP is not constructed, TDM would still be built and be forced to use alternative fuel supplies in order to satisfy the contractual commitments and protect the financial investments made to date.

Should you have any questions, please contact me at (619) 696-2287 or Alberto Abreu at (619) 696-2121.

Very truly yours,